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ORGANIZATIONAL DIAGNOSIS: A REVIEW AND A PROPOSED METHOD

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This report reviews available literature on the desirable properties of a diagnostic procedure for organizational development. A feasible, computerized diagnostic procedure termed CANOPUS (Computerized Analysis of Problems in User Systems) is proposed and conceptualized, and the necessary software for its first two functional components (Calculator and Prioritizer) is provided.

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EXECUTIVE SUMMARY

One of the tasks proposed in the research effort from which this report has stemmed was to "...explore the feasibility of developing a computerized diagnostic report generator." As the body of the report indicates, we have been able to go considerably beyond simple feasibility exploration. Presented here is a description of CANOPUS (a computerized diagnostic and prescription software system), together with an account of progress made to date in its construction. We anticipate that, when complete, it will form a useful, serviceable tool for HRM consultants and their client units.

STATEMENT OF THE PROBLEM

An organization is an open social system, which means that it functions by receiving inputs of resources and energy from the outside world, converts them by a throughput process to a commodity or service which it then exports into the environment in return for replenishment of its resource input. In greatly oversimplified form, one might view the Navy in social systems terms as receiving inputs from American society in the form of manpower from the civilian population and money appropriated by its Congress. The Navy by its functioning converts these resources into an output of defense of the nation, which it "exports," in the sense that it makes it visible, present, and useful in the world.

In the Navy, as in any system, not all of the input appears at the end of the cycle in the form of output. Some of the input must necessarily be consumed in the throughput process itself; that is, some proportion must be diverted to maintain the organization. The more of the input that must be so diverted, in relation to a given output, the less effective the organization is.

The efficiency of the throughput process therefore largely determines the organization's effectiveness, and it is to the improvement of this ratio that organizational development activities such as the Navy's Human Resources Management effort are directed.

In general, development (in the view of those who study living systems) is a function of the appropriate combination of two kinds of things: (1) characteristics of the system which predispose it to experience certain kinds of change (such as particular leadership practices) and (2) events external to it which cause or "trigger" the change to occur when it does (such as training or intervention activities). Characteristics such as leadership practices exist before the consultant arrives on the scene and are necessarily quite varied in form and style. Any specific thing that the consultant does by way of training or intervention is unlikely to be appropriate to all (or even any large number) of such situations. To affect the functioning of the unit constructively, therefore, requires that one carefully match the intervention activity to the needs of each client unit. This, then, is the problem of diagnosis in organizational development--describing organizational characteristics in sufficient detail and with enough accuracy to permit one to match available intervention activities to diagnosed conditions in ways likely to improve effectiveness.

THE PROPOSED PROCEDURE

It is to this set of issues that CANOPUS is addressed. As a procedure, its unique features are the following:

(1) It is almost entirely computerized, which permits it to take account of a wider array of information with greater reliability, validity, and speed than would be possible by methods which rely upon more "clinical" procedures.

(2) It prioritizes problems for attention by the manager or consultant, not only in terms of the level of goodness or badness of the characteristics, but in terms of their relationships to performance criteria as well.

(3) It goes beyond the simple description of strengths and problems to an assessment of their causes (situational factors, information needs, skill deficiencies, and values conflicts).

(4) It recommends possible training or intervention steps which accumulated experience suggests are optimal for situations like the one in hand.

(5) It summarizes both conditions and treatment steps across organizational entities and generates, by computerized text-writing, a written report for managers and their consultants.

Not all of the steps are at present constructed. Two of the initial and most difficult are, however, and it is our hope that the remaining ones will be completed within the next few months.

CONTENTS OF THE REPORT

From this brief overview, the reader may turn, if he chooses, to the body of the report. The first section contains a review of the problems and issues present in organizational diagnosis. We anticipate that this section will be especially useful to consultants, who face almost daily the problems involved in diagnosis and action planning. The second section describes in some detail the CANOPUS procedure and its components, while the appendices provide documentation of the first two such components. These sections, we feel, will be of special interest to those who must handle and analyze survey data for development purposes.

A CONCLUDING NOTE

In designing and beginning the construction of CANOPUS, it has been our intention to provide a tool, not a straightjacket. Like any tool which depends upon systematically stored experience, this one should grow in strength and usefulness as it is used. It is our hope, therefore, that it will be not only useful, but used.

ORGANIZATIONAL DIAGNOSIS: CONCEPTS, ISSUES, AND METHODS

The research proposal stated the following:

> An indicator-based development program such as the Navy Human Goals Plan is only as good as the information system upon which it is based. Data bank storage, retrieval, analysis, and processing capabilities (similar, in at least some aspects to those already in place in the civilian sector in our own data bank) must be established, tested, and subjected to at least a preliminary evaluation...as part of this we would explore the feasibility of developing a computerized diagnostic report generator. (p.3)

The purpose of this present technical report is to fulfill the intent of that concluding phrase. As the reader will soon see, we have been able to go considerably beyond the simple feasibility exploration proposed at the outset. A computer software package has been developed which provides a basic capability of computerized diagnostic report generation most particularly geared to the organizational development process.

In the sections which follow, we shall review first of all the issues, methods, and problems of diagnosis in organizational development, and then in later sections, describe the form and substance of the procedure which has been developed in the present instance. Documentation of the computer software is attached as Appendix A followed by sample printout produced by that software as Appendix B.

The Problem of Diagnosis in Organizational Development

An organization is an open social system. In its most rudimentary form this means that it functions by receiving inputs of resources and energy from the outside world, converts them by a throughput process to a commodity or a service which it then exports into the environment in

return for the replenishment of its resource input. Thus, the cycle repeats and continues. The process is illustrated in Figure 1 both in its general form of an input-throughput-output sequence, and more specifically as it applies to the Navy. In greatly oversimplified form, one might view the Navy in social system terms as receiving inputs from American society in the form of manpower from the civilian population, and money appropriated by its Congress. The Navy by its functioning converts these resources, the energy and talents of the people, and the financial resources appropriated by legislation into an output of defense of the nation, which it "exports," in the sense that it makes it visible, present, and useful in the world. In return for that output, more manpower accrues, new financial resources are appropriated, and thus the cycle repeats itself. In abstract terms the Navy's effectiveness as an organization is represented by the amount of such national defense output which it is able to generate for the inputs received.

In any system, not all of the input appears at the end of the cycle in the form of output. Some of the input must necessarily be consumed in the throughput process itself. Organizations live and exist, and must be maintained. A portion of the input in any system, therefore, is diverted to the maintenance of its internal functioning. The more of the input that must be so diverted, in relation to a given output, the less effective the organization is. Stated in more dynamic terms, an increase in effectiveness amounts to attaining more and/or better output for the same input, or of attaining the same output with less input.

As the only remaining variable, the efficiency of the throughput process itself largely determines this characteristic. It is to this

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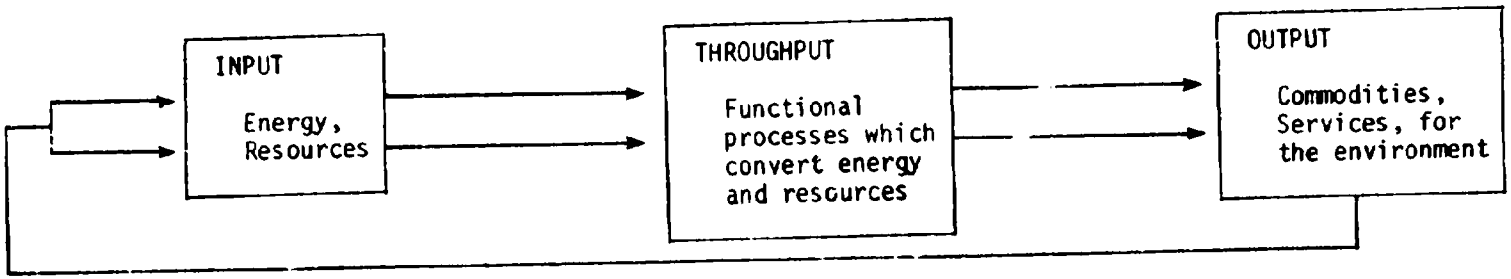
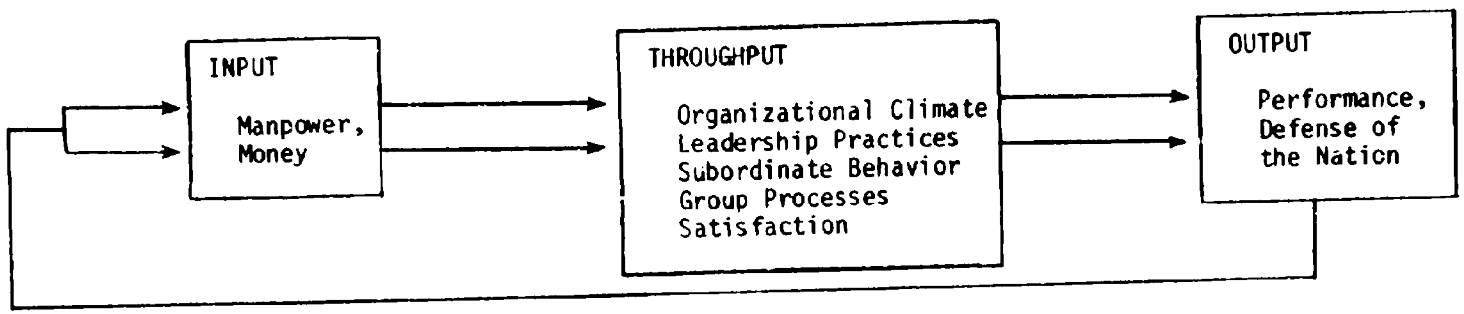
Figure 1

The Organization as a Social System



The Navy as a Social System



problem that organizational development addresses itself, since it represents a systematic planned attempt to upgrade aspects of the throughput process. These upgrading attempts are basically instances of planned, purposeful, constructive change. Change, in the view of those who study living systems is in turn a function of the appropriate combination of two kinds of things: (1) characteristics of the system itself which predispose it to experience certain kinds of change, and (2) events external to it which cause or "trigger" the change to occur when it does. A simple illustration may suffice--jet fuel is combustible, that is, it has a propensity to burn. For a fire to occur aboard ship involving aviation fuel requires a combination of that fuel itself and an appropriate trigger, for example, a flaming match. A flaming match, or a lit cigarette, in a pool of loose fuel will trigger a fire. A biscuit, or a handkerchief, dropped in that same pool of fuel, will not trigger combustion.

Simple and perhaps absurd as this illustration is, it describes in many ways the issue lying at the heart of organizational development. Organizations have characteristics which comprise their functioning, for example, the climate present in the organization, the supervisory behavior of its managers, the mutual behavior of subordinates in the work setting, and the processes of the groups that make it up. For any particular subordinate unit, its particular combination of behaviors and conditions predispose it toward being affected by certain external conditions, not by others. Organizational development interventions, training, and even changes in the external world in which it lives, vary in the impact which they have on different combinations of such conditions. To affect the throughput process of an organizational unit constructively, what one

must do is be certain that an appropriate set of interventions inpinge upon the conditions in that unit. Necessarily, no intervention, training activity, or external event, is relevant to all situations. Rather by their very nature, particular interventions selectively influence organizations with certain characteristics rather than others. Matching the intervention to the organization and its configuration of behaviors, strengths, and problems, requires that one understand what that configuration of strengths and problems is This is in effect, a problem of diagnosis in organizational development--describing organizational characteristics in sufficient detail, and with enough accuracy to permit one to match available intervention activities in ways likely to produce constructive change.

As a discernible field, organizational development is comparatively young. Burke (1973) has indicated that it is barely 15 years old, although various elements that currently are viewed as comprising it date from an earlier period. As a whole--let alone an integrated whole--it seems indisputable that the field is still in its infancy. As a field, it traces its lineage in two related, but different, directions: (1) the world of the practitioner, as, for example, adult education, clinical practice, and the like, and (2) the utilization of scientific research findings in organizational behavior. From the former has stemmed an action orientation, together with a growing concern for accomplishing action objectives more expeditiously and in higher quality fashion. From the latter (scientific research), the field has inherited from the cannons of science a concern for accuracy, along with an awareness of the importance of implementing research findings.

Melded and interwoven, these dual sets of concerns have led to the general recognition that at least two major processes (not just one) are involved in the O.D. field--diagnosis and treatment (Bowers & Norman, 1969). The result is that diagnosis has received increasing attention in recent years. Prominent writers in the field have talked at moderate length about the necessity for a solid diagnosis as a basis for action. Practitioners, similarly, have talked repeatedly about the role played in their efforts by a process that they see as diagnostic. Despite this increased attention, much would appear to constitute less than a satisfactory approach to the problem. While increasingly talked about, diagnosis would appear more often to be paid lip-service than to receive serious attention. The following quotation from Levinson illustrates the nature of the problem:

> That brings us to the problem of diagnosis...I do not yet see that kind of diagnostic process in the literature or in practice which leads to intervention of choice: given an organization of a given kind, at a given point in its development, with given kinds of constituencies and groups of employees, with a given kind of leadership and a given set of problems, what should the strategy of intervention be? toward what anticipated outcome? (Levinson, 1973, p. 201)

To serve the purposes which its name, and its role, intends, a diagnosis should constitute an analysis of the current functional state of a particular system for purposes of determining appropriate treatments (action steps, or interventions). Both the name and this brief definition imply a number of characteristics which should be reflected in any methodologically sound diagnostic effort:

(1) <u>Comprehensiveness</u> - since problems may originate and occur in any part or aspect of a system, any diagnostic effort worthy of the name should treat comprehensively the properties of the system as such, that is, it should not look selectively at a few aspects

of system functioning, ignoring the rest. It should, instead, make as complete an effort as possible at assessing the total functional state of the system.

(2) Theoretical Anchorage - a good diagnosis should look, not merely at an arbitrary array of properties, but at an array of constructs which reflect an underlying scheme that is itself sensible, and which has been derived from the real world by a process of solid research. This framework serves to provide explanatory power by indicating how in general (that is, in most such organizations) various aspects of functioning should relate to one another. Without this, the problem becomes an assessment based upon a somewhat haphazard collection of readings.

(3) Precedence - both its name and its role imply that diagnosis precede and, in part at least, determine which particular treatment from an array of possible treatments should be used in the situation at hand.

(4) Orientation - diagnosis implies an orientation on the part of the consultant primarily toward the client system's well-being rather than simply toward his own.

(5) Differential - diagnosis implies a differential, that is, that there are different states of nature which the employed assessment techniques distinguish from one another, and which ultimately have different action implications.

By way of contrast, there are several things that a diagnosis should not be. It should not be a simple benchmark against which to measure progress. Used in this way, diagnosis would amount to little more than

an evaluation, since it would carry the implication that treatment is determined on some basis other than system assessment. Despite this fact, there would appear to be, at least, some instances in which practitioners welcome measurement, not for the treatment guidance which it provides, but simply to provide possibilities for "proof positive."

Similarly, a diagnosis should not be merely a "map of pitfalls" which permit the consultant to do what he always does anyway, but with minimum risk to himself and others. Using it as a map of pitfalls means that its role in determining treatment is denied it. This use biases as well, to some extent at least, against an orientation toward the client system's well-being first and foremost, and even perhaps negates a bit the differential character which is so necessary for effective guidance of the treatment process.

Finally, differential diagnosis is not simply a matter of variety among consultants. Occasionally writers and practitioners cite the variety of things done by different consultants, or change agents, as evidence for the eclecticism present in the field, and infer from this that treatments are indeed differentially selected on a diagnostic basis. Levinson, in the article previously cited, correctly describes the misleading nature of such a representation. The fact that different consultants employ different techniques says nothing about the extent to which any one of them selects, from among a wide array of quite different treatments, the one which he will in fact use in a specific instance upon the basis of a solid diagnosis of that system's own functioning. The eclecticism, in other words, is not a matter of simple variety in methods and practices among consultants, each of whom may well be highly consistent in what he does from one situation to the next.

We thus arrive at a view that solid, rigorous diagnosis, differential in character, comprehensive against a theoretical framework, is an essential step in determining which treatment to use for purposes of enhancing a particular client system's well-being. It is not a simple benchmark; it is not merely a map of pit-falls; nor is it a matter simply of pointing to the practice differences among consultants. Its usefulness depends upon the care which has been used in doing it, and it is to this issue that we now turn our attention.

Collecting Diagnostic Data

Although an infinite number of data collection methods may be possible, generically they would appear to fall into a quite limited number of categories. Each has its strengths and its weaknesses, and across the lot cut a number of potentially difficult issues. In this section we will first examine the various methods and then look at issues and problems which relate to them.

Methods

The methods of collecting diagnostic data fall basically into two general classifications: (a) those which rely upon the diagnostician's collecting the perceptions of others, and (b) those which rely upon the diagnostician's own more or less direct perceptions. Within the first of these two categories (collecting the perceptions of others) two principal methods have widespread currency - the interview and the questionnaire. These two are not as different in theory as they may appear to be in practice. In the interview, one human being poses to others in verbal form a

series of questions and records their responses. In form, then, it relies upon a human interviewer, and the questions are likely to be relatively open-ended (that is, calling for an expressed view which is recorded as nearly as possible in the respondent's own words). Interviews may be relatively unstructured, in the sense that the questions may be highly general ones whose purpose is to trigger a response recorded verbatim in the respondents own words, or a relatively structured set of questions and probes targeted toward specific pieces of information. The interviewer may, in fact, serve the function in highly structured interviews of simply reading a questionnaire to the respondent and making his checkmarks for him. Included within the general bailiwick of the interview for diagnostic purposes we would include group process meetings. One example of this is cited by Delbecq and Van de Ven (1971). In the particular instance which they describe, a number of members of a client system were brought together for a meeting to discuss their individual and common problems. The process employed was highly structured, with relatively pre-programmed sequences of posting, digestion, analysis, decision making, and the like. The substance of the diagnosis, however, was provided by the participants and was generated from their discussions in the phased meetings. Another example, closer to the Navy's operations, is the Command Action Planning Seminar (CAPS). Somewhat different from this might be the group interview where a series of questions, structured or unstructured, are posed by an interviewer to a group of people, and their collected responses, or perhaps their various individual responses, are noted.

The paper-and-pencil questionnaire is a second of the "indirect" methods. In this instance, the questions are highly structured, specified in advance, duplicated or printed in booklet form, and ordinarily designed to permit largely closed-end responses. Normally, the permitted responses take the form of multiple-choice categories using some form of Likert scale. An alternative to this procedure, proposed in the literature by Jenks (1970), is a Q-sort in which a number of statements are sorted by the respondent to an order corresponding to, for example, their description of him, their description of his supervisor, of the organization, of some part of its processes, or of his fellow employees.

The methods which rely upon the perceptions of the data collector himself encompass both observation and records retrieval, the latter perhaps a marginal member of this category. Observation may take the form of direct reading, or of indirect inference. Direct readings may be person-mediated; for example, an individual observer notes the activities, behavior or reactions of members of the client system during a particular period of time. The resulting data are subsequently used in diagnosis. In somewhat different form, observations may be instrument-mediated as, for example, when audio or video tapes are made of behavior or reaction segments in the client system, and these tapes are then submitted to a diagnostic analysis.

In all of these direct observation instances, the purpose is to assess the functioning of the system by a procedure which records the contents of that functioning. Somewhat different from this is

indirect inference, also based upon observation, which assumes some of the characteristics of projective techniques. In such an instance, the observer would record, not the substance of what was said or done, but the expressions used to say it or the manner in which it was done. He might then infer various functional characteristics, not from the direct observation of their presence or absence, but from the words, terms, and manners by which the materia' had been related. For example, non-verbal cues, facial expressions, or posture during the interview, might be noted, whether the interviewee attributed problems to himself or others (perhaps regardless of their content), or blames factors outside the system might be seen as indicating his defensiveness. The extent to which the interviewee uses evaluative or emotion-laden terms might be noted and seen as indicative of one or another functional state. The respondent's degree of consistency might be taken into account, and the like. Although the questions asked by the interviewer might be identical to questions asked in a direct reading situation, the material recorded would be far different and would reflect more the respondent's manner of answering than the substance of his answer. (c.f., Alderfer, 1968)

Finally, diagnostic material may be retrieved directly from the operating records of the organization itself. Although most organizations do not maintain updated files of information directly concerned with the behavior of members and organizational processes such as, decision-making, motivation, and the like, in many instances material appropriate to a diagnosis of these aspects of system functioning may be obtained from memoranda, policy statements, and

the accounting and control records maintained by the organization. Although the material entered into such records has been, at one stage or another, perceived by a person other than the diagnostician, we class them here in the direct perception category because they comprise, in most instances, fundamental operating data which are then directly perceived by the diagnostician in the diagnostic process.

Although a number of variations on these methods may exist--in fact, the number may be infinite--there would appear to be at least reasonable ground for concluding that they may be categorized into one or another of these general classifications. Still, the goodness of the methods is affected by a number of considerations not directly discernible from a consideration of the methods themselves, and it is to these issues that our attention now turns.

Issues and Problems

Cost and Complexity

In general, observational techniques are the most costly, followed by interviews, with questionnaires the least costly of the proposed techniques (records retrieval is omitted from this comparison because the cost issues are determined in this instance largely by the issue of accessibility to which we will turn our attention shortly). Cost is, in this comparison, rather directly determined by the amount of "chaff" which must be sorted, covered, or sifted through to obtain a given amount of useable, relevant material. Since observation focuses its attention necessarily upon events as they occur, all events,

both those relevant and those irrelevant, must be observed, although the latter may be discarded. The interview, on the other hand, focuses attention upon germane issues, at least to some extent, and, hopefully by that process, eliminates much of the extraneous material, recording instead the useable and relevant. It is still more costly than the questionnaire, however, because for each word spoken, another person must consume time in the listening. The questionnaire, since it does not require a one-to-one human relationship for its completion, and since it prespecifies the material to be collected rather closely, is certainly the least costly of the three.

Training and Skill Required

Diagnostic data are only as useful as they are reliable and valid, and the obtaining of reliable, valid data hinges largely upon the training and skill brought to bear in the collection process. When observational methods are employed, the observers must obviously be highly skilled and trained. If they observe the functioning situation directly, they must know how to record their observations, know the appropriate amount of detail to register, and know how to distinguish one event sequence from the next, that is, how to know when one activity has stopped and another has begun. They must know both how not to be distracted from relevant ongoing activity by peripheral stimuli, and at the same time, know which

peripheral stimuli are in fact relevant to the process they are supposedly observing and which they wish to record. When the observation is instrument-mediated, an additional entire array of technical difficulties are encountered which the subsequent observer-user must know how to handle and solve. Needless to say, indirect inference--the use of semi-projective techniques--requires a high degree of competence and an extensive background in the projection process itself.

Since the observer, in addition to all of these difficulties, is ordinarily an outsider, unfamiliar with the history of the unit whose functioning he is observing, unaware of the double, hidden, and mutually understood meanings of particular phrases, behaviors, actions, and cues, it is likely that his readings will be less reliable and less valid than those which would be provided by familiar "insiders." By standardizing the stimuli in the form of the questions posed to the interviewee, and by relying upon the interviewee's perceptions and interpretations of ongoing functioning, the face-to-face interview removes, at least a part, if not most, of the principal sources of unreliability. To do this, however, requires carefully trained interviewers. It is not simply a matter of any person, with a reasonable degree of intelligence, traveling through the organization asking questions and noting responses. The problem of interviewer bias, as well as of interviewer-induced response bias, is simply too great for that. Yet, in many instances, O.D. practioners rely upon informal interviewing as a source of diagnostic data oblivious to the

pit-falls. The questionnaire, posing as it does the same question in the same form to all respondents and relying upon their familiarity over a period of time with events in the organization, goes the greatest distance, in our judgment, toward resolving the problems of reliability and validity.

Still, what each of these methods contributes in reliability and validity, it to some extent loses in flexibility. Clearly, since little if anything is prestructured, observation permits the greatest degree of flexibility in accounting for unique events in the setting. The interview, if it uses optional probe questions, may take at least some account of this. The structured questionnaire permits little, if any, of this, and its usefulness and validity in the larger sense rely upon the care and comprehensiveness which went into its construction at the outset. Administering questionnaires, of course, requires some training and acquired skill. In general, however, the degree of training and skill required for questionnaire administration is less than that required for interviewing or observation. However, it should be noted that the amount of training and skill going into questionnaire construction is fully as great as the skill required in the other two methods. The difference is that, in the case of the questionnaire, this has been done "once for all." It need not be repeated in each data collection instance, provided that a common or standard instrument is used.

The Problem of N

A diagnosis is as good as the data upon which it is based. To be adequate the data must therefore reflect a fairly large number of specific instances of each situation. In the case of the questionnaire, and to a lesser degree the interview, the data collector (the questionnaire itself, or the interviewer) asks the respondent to summarize, in formulating his response, some appropriate number of occasions in which a particular type of activity has transpired. In the observational instance, however, the number of instances of a particular functional property which may be taken into account are those which have occurred during the time-frame of the observation. This is directly a function of the method itself, and means that a much longer, and therefore more costly, period of information recording must go on in order to encompass the same number of behavioral "cases."

The Sampling of Events

Diagnostic data to be accurate must constitute a representative sample of the universe of behaviors or functional states which they are drawn to reflect. In the case of observational methods, the sample which occurs may reflect too limited a time period to make this possible, or the existence of the observer (the human being doing the observing or the instrument) may well itself distort the events which it is intended to monitor. The methods which rely upon the perceptions of the respondents

themselves rely for the representativeness of their sampling upon the respondent's memory and willingness to encompass a sufficiently broad range. In any specific instance distortions may occur. Nevertheless, the array of events which may at least potentially be taken into account would seem to be larger than in the case of observation. Still it should be kept in mind that the demeanor of the interviewer, or the wording of the questionnaire items, as well as the content encompassed in phrasing the items or questions, may well serve to distort the sample.

Accessibility Problems

All methods suffer to some extent from accessibility problems. Not all participants, nor all situations, may lend themselves to observation. Calendars and time schedules may make it difficult to interview all the necessary members, and potential respondents may absent themselves from questionnaire administration group sessions, or neglect to return distributed or mail-out questionnaires. Accessibility becomes the largest issue, however, in relation to operating records since in these instances, one is ordinarily relying for his information upon records and record keeping systems which were set up with other purposes than diagnosis in mind. Records may not exist, they may be tabulated or compiled in other forms, or they may in fact be considered confidential and denied to the diagnostician.

Time Lag as a Problem

Organizations are dynamic entities, and events move across them in time, creating waves or ripple effects in which a series of events at one time in one part of the system cause other events at other points in time in the same or other parts of the system. Thus, there is an issue to the extent that the data collection method used may not permit aggregation in the respondent's mind which is based upon his knowing precisely what the collected data are intended to represent. Today's events which are being observed, for example, may be the outcome of other events long since past. Operating records may reflect functional states which existed several years previously but which no longer remain. Solving this problem requires that the diagnostician not only know the nature of the constructs which he is measuring and their place in an appropriate cause-effect sequence, but also that he understand the relationship between the specific questions posed or items sought and that theoretical framework. Lacking these, he runs considerable risk of misreading the situation.

Analyzing and Integrating Diagnostic Data

Diagnostic data, once collected, are useless unless submitted to an analytic, synthetic process which integrates those data into an interpreted, coherent form. The methods, issues, and problems of this aspect of diagnosis are fully as important as the collection itself.

Methods

Both quantitative, and non-quantitative methods have currency in existing practice. Non-quantitative methods include narrative summaries of verbal material prepared in some form by the diagnostician or consultant and phrased in his own words or those of the respondents, participant group derivation sessions in which the material is viewed, reviewed, revised, and analyzed by the participants and a conclusion or interpretation generated by them, and the (expert) staff conference in which a group of professionals, perhaps differing in their backgrounds, review the same or substantively somewhat different portions of the data and pool through a discussion procedure their conclusions to a general and meaningful reading. By nature, these non-quantitative methods are largely descriptive; although some use may be made of quantitative material, the emphasis is instead upon the narrative description.

Quantitative methods, on the other hand, require that the data originally collected be converted to numerical scales, either through direct conversion (for example, by key punching or by an optical scanning scoring process) or by the content analysis of verbal material. In the latter case, trained content analysts read or listen to the original material and score each segment in terms of preestablished codes.

Issues and Problems

Time-sampling, Time-frame Problem

Time enters in the interpretation, as it did in the collection, as a potentially confounding issue. Great care must be

taken in the analysis and interpretation of diagnostic data to be certain that events are correctly attributed in the cause-effect sequence in terms of the time sample during which they were collected, or which was taken into account by the respondent in formulating his answers, as well as the historical time-frame which each functional reading represents. Lacking this, the picture which results may be a caricature rather than a reasonable likeness, and the tail may all too often be interpreted as wagging the dog. No handy rule-of-thumb is possible in handling this problem. It requires instead substantial background and technical expertise in the area of organizational data collection. Still, in part the problem may be solved by pre-programming the steps and relying upon computerized processes designed by those persons who do have the necessary expertise.

Expertise Versus Involvement

Persons are known to be more motivated by processes in which they are involved. At the same time, diagnosis of an organization and its functional state is a complex skill. To some extent, therefore, the analytic, interpretive aspects of diagnosis pose a dilemma between a necessity for bringing to bear the expertise of the technically trained without sacrificing the motivated involvement of the participants themselves. It is a tightrope which requires a careful tread. Most especially, it requires that the expertise requisite for the process not be delivered in a fashion which antagonizes, becomes overbearing,

or appears to denigrate the participants, their knowledge, and their importance.

The Confounding Problem - Horseback Revisions

Even the most accurate diagnosis may suffer from mid-stream or horseback revisions made by the consultant as he approaches its use. Basically, any data collection and analysis method treats with some degree of care and accuracy a portion, but not all, of the behaviors, events, and issues in the life space of the client system. Some portion is unique to that system, or to any group within it, or will have been excluded from the array of information categories designed in the diagnostic process at its inception. As the consultant approaches a particular unit or group of the client system, he will necessarily see other aspects of what he feels are its functioning not represented in the diagnosis which he has in hand. Since he is dealing with a real client, in a real world situation, the temptation is well nigh irresistable to revise the diagnosis on the basis of his current observation. Yet, he is one observer observing at best a limited and time-bound behavior sample. To the extent that he makes such revisions he, therefore, very likely reduces both the reliability and the validity of the diagnosis with which he works. Said otherwise, he approaches each group, or each setting, as a unique instance with live people and real problems. Yet in many ways the diagnosis and treatment problem in organizational development is a "large N" problem. Were he to work

on the basis of the diagnostic data provided to him and that alone, given that it is reliable and valid, he would, across a large number of cases, succeed in a high portion (assuming that the diagnostic and prescription processes are themselves high in quality, reliable, and valid). Yet he does not ordinarily approach his role with that degree of objective detachment, and each time that he yields to the temptation to revise on the basis of "current reality" he submits himself to a situation in which his action steps are based on less than acceptably reliable and valid data.

Multiple Methods and Redundancy

A persuasive case is made in the literature for the use of multiple data collection and interpretation methods in the diagnosis. To the extent that questionnaire data may be supplemented by interview and even observational data and the same reality discerned, one may have a greater degree of confidence in the diagnosis that results. This, of course, increases the cost, but it may in many instances, if not most, be judged worth the investment.

Norms and Their Relevance

Diagnostic data, whether quantitative or narrative, are at best descriptive until they are compared to a standard. The standard, of course, may be the wording of the response categories of the original items. More useful, perhaps, is the use of norms in which the behavior or responses, typical of a group

or person like that being diagnosed, are established as a comparison standard. Lacking norms, one runs a real risk of classifying as "good" behavior which, in fact, is less than acceptable, and classifying as "bad" behavior which is really not so. In all instances in which norms are used, however, one should recall that the norm is, at best, a description of the typical behavior of a person or group like that currently being diagnosed; it does not necessarily reflect an ideal--nor perhaps even a desirable--state.

Presenting Diagnostic Data

Diagnostic data obtain their usefulness when they are presented to persons with critical roles in the treatment or development process. In some instances, diagnostic data are digested only by the consultant or change agent himself and represent only his notes to himself, perhaps on tape, perhaps in memo form, perhaps simply retained in his memory. More often than not, however, presentation of the diagnostic data is made throughout the client system with which subsequent work is to be done. In such instances, the diagnostic data may be presented in written form (that is, in the form of a diagnostic report or "workup"), orally (that is, talked through with the client system or its key members), or by some combination of multi-media methods, perhaps a narrated report accompanied by a written summary, graphic displays, and the like. A number of issues arise in such instances, many of them subject to substantial disagreement among practitioners.

Amount of Interpretation Provided

For some practitioners, interpretation provided by a consultant or diagnostic expert is felt best kept to a minimum. Again, as in the analytic process, the supposition is that client motivation toward constructive change is greater when client participation in the interpretative process is maximal. In such instances, diagnoses would tend to be presented as "bare facts" in perhaps tabular or graphic form or in simple anecdotal or descriptive terms. For others, however, interpretation drawing upon the best available skills of diagnostician, scientist, and practitioner, is owed to the client system.

Complexity Versus Simplicity

Whatever the degree of interpretation provided, there would appear to be reasonable agreement that the diagnosis in its presentation to the client system must be kept simple enough to be readily understood by its members. Far from representing a patronizing stance, this represents a sensible commitment to minimize or, if possible eliminate, professional jargon, to avoid ambiguous wording, and to make the interpretive points which are presented as simple, clear, and straightforward as possible.

Transduction

Throughout this process the consultant is a tranducer, that is, an information link between a body of knowledge and a user system. It is his task to convert the information which comes as it does from

outside of the organization's immediate repertoire to a form in which it can be freely circulated and digested inside the organization. This requires a relatively active stance on the consultant's part, yet not one which is overbearing, pretentious, or oppressive. Process skills are required, but more than process skill is necessary. Substance in the form of the diagnosis is entering the organization as a social system, and to the consultant falls the task of being certain that that entering information is put to constructive uses, and that maximal benefit is gained from it.

Breadth and Geographical Dispersion

When the organization is geographically widely dispersed more use necessarily must be made of written presentation forms. In such instances, some use may be made of verbal presentations carefully spotted in key locations, but it is to the written word, its clarity and efficiency that greatest reliance falls.

Speed

A diagnosis which consumes months in the construction may be elegant, yet useless, since much hinges upon the currency of the diagnosed situation. In general, the faster the diagnosis can be returned, the more relevant and urgent it will be to the client system and to its efforts to improve. No definite turnaround time guidelines can be given, and the time will necessarily be longer for more complex systems, yet a period of a few weeks seems the maximum duration that may be safely allowed in most organizations.

Summary of the Field

In the pages thus far we have reviewed the problem of diagnosis in general, the methods of collecting data, the methods of analyzing and integrating diagnostic data, and the methods of presenting the data so analyzed and interpreted back to the client system. To reiterate what has been stated thus far, a diagnosis requires a comprehensive analysis of the current state of the system, an analysis which precedes, and in part determines, a treatment from a possible array of treatments. It must be differential, it must be oriented primarily toward the client system's well-being, and it ought not be a simple benchmark, a map of pitfalls for the change agent or consultant, nor a simple earmarking of the style differences among existing consultants. Data may be collected by interview, questionnaire, observation, or from the operating records of the organization itself. The data, once collected, may be analyzed quantitatively or summarized in non-quantitative descriptive form. The picture which emerges may be presented in writing, a method which is especially useful for subsequent retrieval and for circulation to geographically dispersed locations; or it may be presented orally, or by some combination of methods. Throughout, however, the diagnostician and his consultant counterpart have the responsibility for bringing into the organization and its operating situation an adequately interpreted, reliable, valid, body of data which in relation to known principles of management differentially assess the current states of organizational functioning. It is this professional, differential, analytic procedure which constitutes a genuine diagnosis and which unfortunately is all too seldom provided in the organizational development world. In the present

instance, we have undertaken to build a system to provide an accurate differential diagnosis for organizations and their component subsystems. As such, it relies heavily upon the computer, analyses data from paper-and-pencil questionnaires in relation to stored data from the operating records of organizations, and hopefully provides data with considerable speed at an acceptable level of accuracy and detail. In the remainder of the report we will describe the background, the general scheme and the procedures for this diagnostic system.

TOWARD A COMPUTERIZED DIAGNOSTIC REPORT GENERATOR

The computerized diagnostic procedure proposed in the remainder of this report attempts to fullfill the requirements stated at the outset. It is reasonably comprehensive, in that it assesses the total functional state of the organization insofar as our research has identified the properties of that functional state. Furthermore, it is sufficiently flexible to permit the addition, removal, or substitution of component characteristics and their measures. Used with the Navy Human Resource Management Survey, with our own Survey of Organizations, or with similar and derivative instruments, it reflects an explanatory scheme (i.e., a set of management principles) that has emerged from years of rigorous research.

It assumes, as we feel a good diagnostic procedure should, that its output will precede and help determine different treatments selected to fit the states of functioning that it describes. Finally, it has been constructed with the thought in mind that the purpose in the end is the client system's (not the diagnostician's, not the consultant's) greater well-being.

It further assumes that data have been collected from all, or at least a generous representative sample, of the members of the client organization, and is designed with the paper-and-pencil questionnaire in mind as its data source. It relies extensively upon norms (that is, stored measures typical of various kinds of client groups).

The procedure to be described draws heavily upon a design first formulated in general terms more than five years ago by members of the Organizational Development Research Program staff. The broader design was given by us the acronym "CANOPUS*," standing for Computerized Analysis of Organizational Problems in User Systems and was viewed as containing both computerized diagnostic and computerized prescriptive elements. While the elements were thus identified relatively early in the history of the research Program, the need was not recognized as urgent until organizational efforts on a massive scale emerged as a real and present fact in the Navy's human resource and manpower programs. Because diagnostic capability was a clear need of the Human Goals effort, it was judged most appropriate to propose that the diagnostic elements be developed under a contract closely tied thereto. The prescriptive elements, on the other hand, appeared to us to involve applied research in the manpower area, as well as development, and were therefore proposed for funding under the Manpower R & D program. Both were approved for initial work. Each makes greatest sense in combination with the other. Yet it should be clearly understood that the contract under which this particular report is prepared is that which funds the diagnostic-descriptive segments of the overall system.

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*Origin of the acronym: Canopus has multiple referents. In celestial terms, it is one of the brightest stars, found in the Corina (keel) portion of the constellation Argo (Jason's ship). In ancient mythology, Argo could utter prophecies because it contained a piece of wood from the sacred oak tree. Conopus was also the pilot of Menelaus, and the city in Egypt where he was buried assumed his name. This city was famous for its representation of Osiris in the form of a vessel or jar, containing the vital organs of the human system.

CANOPUS - Its Design and Functions

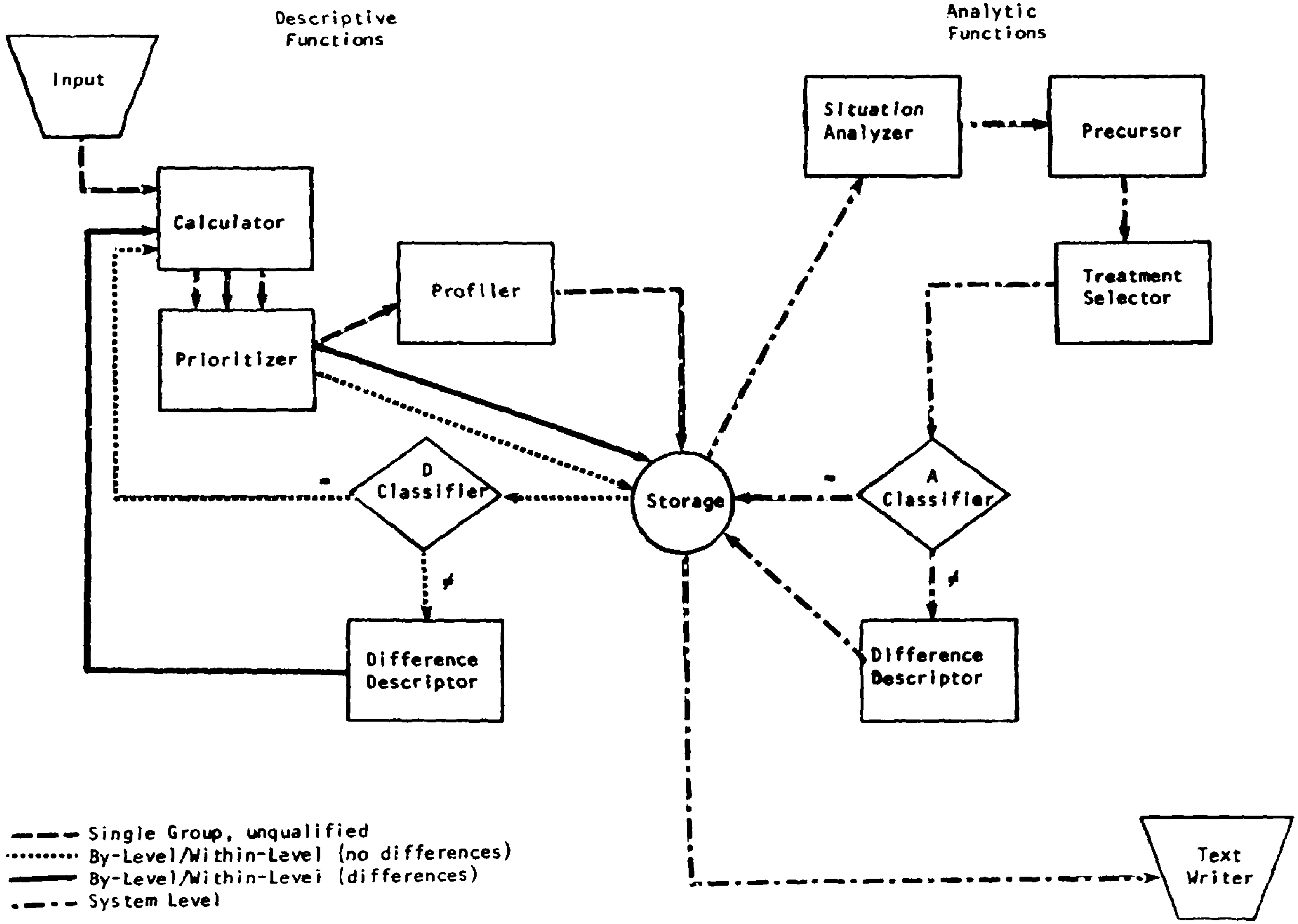
A functional layout of the CANOPUS Procedure, as it should ultimately develop, is presented in Figure 2. As this chart indicates, the entire sequence may be viewed as containing descriptive functions (those operations whose purpose is to generate summary statistics concerning existing conditions) and analytic functions (those operations whose purpose is to determine the reasons for, and recommended action steps to ameliorate, existing conditions). The components within these two broad functions, plus input, storage, and text-writing functions, form the basic steps of the procedure. Each is spelled out in somewhat greater detail in the paragraphs below:

INPUT - The input to the procedure are records containing the mean item and index scores of individuals in integral work groups in the organization. (A work group is defined as all persons who report immediately to a particular supervisor.)

CALCULATOR - Survey scores are relatively useless number sets until some comparison is made to a standard. Many such comparison standards are possible. Scores might, for example, be compared to the original wording of the response alternatives. If 75 per cent of the members of a group provide a "5" response and this alternative was worded "very satisfied," it conveys at least limited meaning. However, if most groups display 100 per cent in this "5" category and the group at hand does not, it means something quite different from what would be meant by comparison to a standard in which most groups show only 25 per cent as "very satisfied." Another approach

Figure 2

The CANOPUS System: Functional Components and Flow



would be to compare each group to the average of all groups in the particular organization surveyed. This also should be dismissed for some of the same reasons: no matter how excellent or atrocious the ship or shore station's record, half of the groups will be shown as comparatively "good" and half comparatively "bad." In the CANOPUS procedure we have opted for comparison to national (e.g., Navy-wide) norms representing a population of groups like the one in question (same level, same type of unit or function). The CALCULATOR component takes the group's mean score and converts it to a percentile score in the appropriate normative distribution.

PRIORITIZER - The percentile score is but one indicator of the seriousness of a particular problem or the contribution of a particular organizational strength. In simple terms, it indicates how low or how high the group stands in comparison to other, similar groups. Lacking any other information, both managers and consultants often assume that a high score (whether in raw or percentile form) indicates an area needing little or no attention. Conversely, a low score is, in itself, often interpreted as flagging a condition high on the priority list of matters demanding concern. Yet it may not be so. While, in general, the whole array of measures relates to effectiveness, for any particular group any single measure may have a low, not a high, impact upon satisfaction and performance. For this reason, it may often

occur that a measure of intermediate negativeness is more critical in its effect than is another, "worse" indicator. What this suggests is that the level of a survey measure must be prioritized for concern and attention in terms of its impact upon effectiveness. PRIORITIZER does this by weighting each measure in terms of its relationship to outcomes, as indicated by standard data in the normative array. The resulting predicted scores become the basis for prioritizing the percentile scores generated in the previous step.

PROFILER - From concurrent research under another contract, we have determined that a limited number of relatively "pure" types of groups exist in the Navy, as in civilian organizations. The findings (still in the report preparation stage) indicate furthermore that these types respond differentially to various action or development techniques. Both to generate additional diagnostic information for the group and its consultant and to provide one basis for treatment selection, it is necessary to match the group at hand to these stored profiles and identify the type with which it is most consistent. PROFILER makes this match, and by a set of preprogrammed decision rules, identifies the best-fit type for the group at hand.

D-CLASSIFIER - Descriptive data must be aggregated in some form if two requisite conditions are to be met: (a) a capability of grasping their meaning to the system, and (b) the

protection of confidentiality. D-Classifier initiates this process by deciding (according to pre-programmed rules) whether the groups in an entire level (e.g., groups under first-line supervision) of an organization or unit are homogeneous or heterogeneous in types identified by PROFILER. If the determination is that the groups are homogeneous, the entire array is looped back through CALCULATOR and PRIORITIZER to generate a whole-level reading similar to that for any group. On the other hand, if the determination is that they are different, the array is sent to D-DIFFERENCE DESCRIPTOR prior to its resubmission.

D-DIFFERENCE DESCRIPTOR - This component combines sub-sets of the array into type-homogeneous sets and submits each to CALCULATOR and PRIORITIZER for the generation of whole-set readings appropriate to the level. As a result, not one, but several composite readings are generated.

SITUATION ANALYZER - Description is but one phase of diagnosis; it provides the "what" of the situation. Why conditions occur is equally, if not more, important. Observable problems or deficiencies may, in theory, be caused by (a) constraining situations, (b) information deficiencies, (c) skill deficiencies, or (d) values conflicts. SITUATION ANALYZER examines the extent to which the first of these (constraining situation) is associated with diagnosed conditions. It does so by comparing conditions which would be predicted from our knowledge of constraints present in such things as the

group's organizational climate (and our knowledge of how this typically relates) with those conditions which actually exist. An absence of an appreciable difference between the actual and situation-predicted scores is viewed as evidence for substantial situational causation. The existence of an appreciable difference, on the other hand, is seen as reducing the plausibility of situational causation.

PRECURSOR - Once the effects of situational constraints are eliminated, attention necessarily turns to the other three categories (information deficiencies, skill deficiencies, and values conflicts) as potential causes of observed problems. Information regarding the degree to which each of these obtains in any current instance must come from sources largely external to the Human Resources Management Survey. Assuming that it is available and has been entered, however, PRECURSOR examines the extent to which diagnosed conditions (represented by residual scores from the SITUATION ANALYZER component) may be attributed to a lack of information, to a lack of skill, or to a conflict in values.

TREATMENT SELECTOR - From the knowledge bank underlying the earlier PROFILER component, and from stored history as it gradually accumulates, the results thus far form the basis for selecting one or more recommended action steps which have the highest probability of success.

A-CLASSIFIER - Although each group's results are ultimately printed out separately (presumably for the use by members and their supervisor), there remains a necessity of aggregating causal patterns and recommended action steps across whole levels of the organization. Both busy schedules and the requirements of action-planning make this step advisable. A-CLASSIFIER performs a function similar to D-CLASSIFIER, in that it decides (by pre-programmed rules) whether causal patterns and action recommendations are homogeneous or heterogeneous for groups within the level. If homogeneous, the results are transmitted to storage for ultimate printout. If heterogeneous, they move to A-DIFFERENCE DESCRIPTOR prior to going to storage.

A-DIFFERENCE DESCRIPTOR - By pre-programmed rules, this component combines sub-sets of groups within the level whose causal and action statements seem similar. It then transmits its results to storage.

STORAGE - As its name implies, this component serves as the in-process repository for original and processed data. All of the necessary results (for each group and level) flow from it to the final component in the process.

TEXT WRITER - Here are stored phrases, statements, and paragraphs germane to each of the condition-sets which may result. From the information transmitted to it from STORAGE, TEXT WRITER prints out a narrative statement for each group,

and for the system concerning its levels and overall functioning. Included are prioritized percentile scores, causal conditions, and recommended action steps.

The remainder of the main segment of this report will discuss the role played in this procedure by the norm matrix, will present questions which may have arisen in the reader's mind and hopefully answer them, and will end with a discussion of steps that remain to be taken.

The Norm Matrix

As an earlier section of the report stated, any set of measures, to be diagnostically useful, must be compared to some standard. A number are possible; in this instance we have elected to use normative data--i.e., stored data descriptive of a number of possible, "typical" client units--as the comparison standard.

Normative data are difficult to obtain, ordinarily accumulating in proportion to the frequency with which an instrument is used, the size of the client system and its coverage with the survey, and the like. Within any given body of normative data, some trade-off must be made between the usefulness which accrues from cross-cutting it into increasingly specific sets (e.g., all E-6's aboard destroyers) and numbers of cases (which decline in each set as the number of sets increases).

In this proposed procedure we have opted for an intermediate degree of stratification, one which we feel probably meets the needs of most organizational development practitioners and their client units. It is shown graphically in Figure 3.

Figure 3

The Norm Matrix

Functional Types*

Hierarchical Levels		A	B	C	--------	N
	Top Management					
	Upper-Middle Management					
	Lower-Middle Management					
	Non-Supervisory					

*Functional types may be distinguished on any convenient basis. Thus, for the Navy, it might consist of types of ships and shore-stations.

On the vertical axis are indicated rows representing level of the organization at which any group might fall. The basis for thus providing different norms for different levels is twofold:

(a) Extensive research shows that conditions simply are naturally "better" up the line than down below. In part, this reflects the fact that more capable persons are selected for advancement in any organization. In part, it also reflects the greater latitude and command of resources that exists at higher levels. Regardless of the causes, the condition makes it evident that it is in some degree inaccurate to compare groups to a common standard.

(b) Research findings, reported elsewhere, make it clear that, in the Navy, the quality of organizational practices which one experiences rises directly with the reporting level of one's group (Franklin, 1974).

The horizontal axis indicates functional distinctions. This refers to a differentiation among "kinds" of units--ship types, types of shore stations, and the like. Previous research has indicated that, in the Navy, ships and shore stations are substantially different from one another and that ship types are similarly quite varied. We anticipate that, for any organization like the Navy, it will be desirable to make the normative comparisons function-specific.

Within any cell of the norm matrix are stored two kinds of information useful to the diagnostic process:

(a) the normative values themselves, in the form of survey index values and their coordinate percentile equivalents;

(b) regression coefficients between each survey measure as a predictor variable and outcome measures appropriate to a unit representative of that cell.

As an accumulated, stored history indicates a need for revision, both the percentile values and the relationship of each measure to outcome variables (e.g., satisfaction, retention, health, or operating performance) may be modified to make them more current. Furthermore, since the procedure relies upon stored values typical of the cell, any values may be inserted, thus providing the potential for simulation studies to aid personnel policy-makers.

The judgment concerning how frequently to revise and update norms is arbitrary and the criteria necessarily somewhat vague. It must be sufficiently frequent to keep the normative array current, yet not so frequent as to disrupt the ability to make progress comparisons. Of course, as the array becomes larger, the addition of any new increment has less impact upon the stored values. As an arbitrary rule, perhaps a frequency of once per year might be considered an optimal interval at the outset.

Issues and Answers

Finally, there are certain issues and questions which doubtless have occurred to the reader which ought be addressed. They are posed below in the form of questions, followed by brief responses.

What measures form the basis for the diagnosis?

Although any measures having the same format could be used, in the present instance the procedure uses the items and indices from the Navy Human Resource Management Survey (or its civilian antecedent, the ISR Survey of Organizations). Thus the measures tap organizational (command) climate, supervisory leadership behavior, subordinate peer behavior, emergent group processes, and outcome measures, as well as special purpose measures in a number of areas.

What is the analysis unit for diagnostic purposes?

The face-to-face work group (defined as the immediate subordinates of a supervisor) is the analytic unit, since a considerable amount of research has indicated that groups, rather than individuals, are the basic building blocks of organizations. In this vein, the procedure uses the group mean score as indicative of the perception of the "average" or "typical" group member, and it is this measure for which a percentile score is generated.

What cause-and-effect assumptions are made in this procedure?

It assumes that the organization is an open social system, in which nothing really "exists" but the behavior of its members. These behaviors combine to form characteristics (called "emergent properties") that are different from (or perhaps greater or less than) the sum of the component

behaviors. Thus, group processes are seen as characteristics, above and beyond the behaviors of group members, which emerge from those behaviors. Organizational climate is similarly an emergent characteristic, resulting from the group processes of numerous groups and affecting (as a situational constraint) the functioning of some other group. Perhaps the most familiar emergent property of any group is its performance. Evidence reinforcing the validity of this sequence in both civilian and Navy settings has been provided in several recent technical reports (Franklin, 1973, 1974). Behaviors, themselves, are seen as caused by any of four kinds of factors: information, skill, values, and the situation. These antecedent characteristics are termed "precursors" and a comprehension of them is seen as adding to the diagnostician's ability to understand why behavior of a particular form occurs (Bowers, Franklin and Pecorella, 1973).

Are the measures stored in the norm matrix taken from this group itself, or from some other source?

By definition, normative data are those presumed to be representative of a whole population or sub-population. Therefore, each cell of the norm matrix contains, at any given time, all of the data thus far collected from persons in groups identified as belonging to the cell. Unless previous waves of collected data have been entered into the matrix and the present group was previously surveyed, none of the data in the cell will have come from the group at hand.

Similarly, the relationships to outcomes (regression coefficients) stored in the cells of the matrix are those found to be typical for groups of this kind. Of course, in using the procedure, a large organization will want to accumulate its own values and coefficients from large numbers of its own groups. These values and coefficients will then serve the necessary normative functions.

Why must norms be external to the unit being diagnosed?

As the text indicates, "internal" comparisons--i.e., comparisons of each group to the average of groups in its own unit--forces half to be "bad," half to be "good," and can be quite misleading. Of course, the same situation occurs in theory when comparison is made to national norms: half of the national array is portrayed as good, half bad. Yet the difficulty declines in direct proportion to the breadth of the array. A group, aboard a destroyer, which is compared to the average group aboard that destroyer <u>only</u>, runs maximum risk of comparative distortion. When compared to <u>all</u> such groups aboard <u>all</u> destroyers, the distortion is vastly reduced.

<u>What Has Been Accomplished and What Remains To Be Done</u>

Of the components viewed at the outset as suitable for immediate work, two are presented in the appendices to this report as substantially complete (CALCULATOR and PRIORITIZER). Appendix A presents a general

description of the software contained in these two components, together with a copy of the computer program itself. Appendix B presents sample output from the two components.

Of the components which remain, some are viewed as relatively simple and straightforward, whereas others (such as SITUATION ANALYZER) are deemed more complex. In the months which remain, our effort will be directed toward these remaining steps, especially toward the more complex ones.

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Appendix A

Description and Computer Program for the Calculator and Prioritizer Functions

PNORM

GENERAL DESCRIPTION

PNORM performs two basic functions utilizing data from two data sets, identified as MASTER NORMS and SITE NORMS. These functions are:

A. Percentile score construction and scanning for the SITE NORMS data based on (A1) MASTER NORMS deciles (A2) deciles computed from the SITE NORMS data set alone or (A3) deciles computed using a data set at some prior time.

B. Ranked predicted criterion score construction and scanning. Predicted criterion scores are constructed by a simple regression model relating functional measures to criterion, either using (B1) MASTER NORMS to establish regression coefficients and deciles for application to SITE NORMS or (B2) using SITE NORMS alone, or (B3) applying a set of regression coefficients and deciles computed using a data set at some prior time.

FUNCTION A. There are three "modes" in which function A. can be executed, A1, A2 and A3. A1 assumes that a MASTER NORMS data set is used currently to establish deciles for the SITE NORMS data, A2 assumes the SITE NORMS will be used to generate its own decile sets and A3 assumes that deciles have been computed by a prior computer run.

MODE A1. Here the MASTER NORMS data set is read and aggregated into groups ordered by stratum (see keywords (GVAR, SVAR) and deciles computed in STRATUM/VARIABLE order. They are written using unformatted FORTRAN on the permanent disk file FT04F001. Next, the SITE NORMS data set is read, aggregated and sorted into the same STRATUM/GROUP set and the MASTER NORMS deciles used to convert the aggregated data into percentile scores. These percentile scores are then scanned for "outlying" variables within groups defined by keywords PMIN, PMAX and the outliers are printed for each group. Keywords MASTER, NORM and INFI are used in this mode.

MODE A2. This is the same as A1 except that the SITE NORMS data set is used to compute its own deciles, rather than using those from a MASTER NORMS data set. The aggregation, sorting, percentizing and scanning remains the same. Keywords NOMA and INFI are relevant here.

MODE A3. Here the procedure is the same as in A1 except that the MASTER NORMS data set has been used at some prior point in time and only the decile sets (residing in permanent disk FY04F001) are used. Again the aggregation, sorting, percentizing and scanning is the same. Keywords NORM and INFI are relevant.

FUNCTION B. This function can again be implemented through three alternative modes, depending on whether the MASTER NORMS data set is used currently, or was used in a prior computer job, to estimate the regression coefficients.

MODE B1. In the first mode, the MASTER NORMS data set is used to generate a set of simple regression coefficients between the functional measures and a criterion variable. Since all variables must be in standard score form (i.e., means of zero and standard deviation of one) in all three modes, these "Beta" coefficients are identical to the Pearson's r's between the same pairs of variables. If the data are not in standard score form, the keyword STAN must be used to standardize the variables internal to the PNORM program prior to the regression calculations. The obtained regression coefficients are then applied to the SITE NORMS data in a second job step to produce a set of PREDICTED CRITERION SCORES. These PREDICTED CRITERION SCORES are then scanned for outliers in the same manner as in function A above. MODE 1 is obtained by indicating the keywords PREDICTION and MASTER on the parameter card.

MODE B2. In the second mode everything is as above, except that only the SITE NORMS data set is used. First, simple regression coefficients are computed, again using the functional measures as predictors and the criteria as dependent variables. Now, however, the predicted criterion scores are arrived at using the same SITE NORMS functional measures as predictors. Keywords PRED and NOMA are invoked to implement this mode.

MODE B3. The third mode assumes that regression coefficients and deciles have been calculated by a prior procedure using a relevant data set and have been placed in the permanent disk data set defined by DSRN IN. These coefficients are read by the program and then applied against functional measures from the SITE NORMS data set to generate predicted criterion scores. Keywords PRED and REGR are used for this mode.

Input Input to the program consists of an OSIRIS data set and control cards.

Output The output consists of the program printout, and sets of simple regression coefficients in DSRN IN (if the PREDICTED CRITERION SCORE mode is chosen).

STANDARD OSIRIS FEATURES

Case and variable selection. The OSIRIS standard global filter option is available to select a subset of cases from the input data. In addition, the keyword parameter BADDATA allows the user to skip cases having "BAD" values (e.g., blanks or special characters).

Transforming data. OSIRIS Recode statements in decimal mode may be used with the program. (See ref. 1 in Appendix B of the OSIRIS Manual)

Missing data. The keyword parameter MDATA=(NONE, MD1, MD2, BOTH) allows the user to exclude either MD1, MD2 or both "missing data" values. (See global parameters)

PRINTED OUTPUT

The major components of the printout are specified below.

For Function A:

A. Interpretation of control cards and listing of input dictionary. All options are given program interpretation and the input dictionary (comprised of the GROUP variable, STRATA variable, and all NORM variables) is printed.

B. Aggregated Data Matrix. A matrix whose rows are groups and columns norm variables is printed. The elements represent mean values for all cases in the data set having the particular group.

C. Decile Printout. (Optional) A matrix of data for each strata is printed giving the deciles for each variable based on the mean values for all groups within the particular strata.

D. Percentized Matrix. A matrix of data corresponding to the aggregated data matrix whose values are percentile scores associated with the aggregated data matrix.

E. Norm Extremes. A listing of extreme NORM or CRITERION scores for each group determined by the MAXP, MINP keyword parameters. The output has the following format:

```
                  *** LISTING OF NORM EXTREMES BY GROUP
                      RANK ORDERING BY PERCENTILE MAGNITUDE

                  *** STRATA NO. xxx  GROUP NO. xxx   SAMPLE SIZE = xxxx
     One set      *** HIGH NORMS
     for                VARIABLE NUMBER                   PERCENTILE
     each
     group        *** LOW NORMS
                        VARIABLE NUMBER                   PERCENTILE
```

etc., where the variable number within the HIGH NORM and LOW NORM sets are printed by ascending percentile order.

All the previous printout is listed once for the MASTER NORMS data set and again for the SITE NORMS data set, subject to the DECILE/NODECILE keyword, allowing decile printout expression on either or both data sets.

For Function B:

All of the above A-E components are printed. However, the DECILE printout gives the deciles for each group across all variables rather than by variable across all groups in a strata as in Function A. The PERCENTIZED MATRIX, it is reminded, has been computed using the ordering of the predicted criterion scores for each group. In addition, the following two matrices are printed (after B. - Aggregated Data Matrix).

I. Standardized Data Matrix. The matrix of aggregated data transformed (by variable within strata) to standard scores, i.e., STD. SCORE=(SCORE-MEAN)/STD. DEV.

II. Predicted Criterion Matrix. Matrix giving the results of applying the simple regression coefficients to the standardized data (BI.). The percentized predicted criterion score matrix is scanned in the same manner and has the same output format as described for Function A. (printout E.) above.

INPUT OSIRIS DATA SET

Data must be input in the form of an OSIRIS data set, type 1 or type 3. A maximum of 202 variables, including the group variable, strata variable and all norm variables may be used in a run. A maximum of 220 variables total (i.e., including recode type variables) may be used.

RESTRICTIONS

1. Maximum number of groups is 300.
2. Maximum number of strata is 100.
3. Maximum number of NORM variables is 200.
4. Maximum total number of variables is 220. (Includes group, strata, norm and recode variables.)
5. Each group must have a unique stratum associated with it.

6. The strata variable for the SITE NORMS data set must have codes that match the MASTER NORMS codes exactly. (The 1st stratum code decile set is used to percentize the aggregated data for the 1st SITE NORMS data set stratum, the 2nd stratum code decile set is used to percentize the aggregated data for the 2nd SITE NORMS data set stratum,..., etc.)

7. No limit on number of cases.

8. Maximum number of groups within one stratum is 100.

TEMPORARY DISK STORAGE

There are three temporary disk data sets used by the PNORM program. They are referred to symbolically as ITEMP, ISAVE and IN in SUBROUTINE INPUT and are presently assigned DSNR's 3, 4 and 7, respectively. The functions of these data sets is as follows:

ITEMP is used in SUBROUTINE SORT to hold a complete copy of the fullword input data and uses unformated FORTRAN Read/Write statements. Thus, the amount of space required is N*NV*4 bytes, where N is the number of cases passing the filter, missing data and bad data checks and NV is the number NORM variables plus three.

ISAVE is used to store the deciles generated by the MASTER data set job step. Writing is done in SUBROUTINE PCENT and the deciles are read back in and used for percentizing the SITE NORMS data in SUBROUTINE MACHO. Space required is NV*NS*44 bytes where NS is the number of strata.

IN is used to read regression coefficients set up prior to the running of a PREDICTED CRITERION SCORE job step. Since there must be one regression coefficient for each criterion variable for each strata, the space requirement is NV*NS*4 bytes.

Both ISAVE and IN are also used with unformated FORTRAN READ/WRITE.

EXECUTING THE PROGRAM

The Job Control Language, monitor control cards and program control cards needed to execute PNORM are outlined below. Cards must be supplied in the indicated order. Refer to Appendix A of the OSIR's Manual for details on the OSIRIS Monitor and its catalogued procedure and Appendix E of the OSIRIS Manual for assistance with JCL. The 'xxxx' in the ddnames that follow are determined by the parameter INFILE.

```
//    EXEC     OSIRIS
//DICTxxxx  DD    Describe the input dictionary
                  (Omit this DD card if $DICT is used.)
//DATAxxxx  DD    Describe the input data file.
                  (Omit this DD card if $DATA is used.)
//SETUP  DD  *

$RUN PNORM

$RECODE (Optional)
     Recode statements

$SETUP
     1.  Global filter.  (Optional)
     2.  Label card.
     3.  Global parameters.
     4.  Variable list.

$DICT (Optional)
     Dictionary cards.

$DATA.(Optional)
     Data cards.

/*
```

PROGRAM CONTROL CARDS

Refer to Appendix C of the OSIRIS Manual for detailed descriptions of the standard OSIRIS program control cards, items 1-4 below.

1. <u>Global filter</u>. (Optional) Selects a subset of cases to be used in the runs.

   Example: INCLUDE V25=2-9*

2. <u>Label card</u>. One card containing up to 80 characters to label the printed output.

   Example: PNORM RUN FOR MALES ONLY

3. <u>Global parameters</u>. Parameters are chosen from thosedescribed below, must be seprrated by blanks and/or commas, and must be terminated with an asterisk. Defaults are underlined.

   Example: GVAR=1, SVAR=2 DECILES*

   SVAR=variable number — The variable number to be used as the stratum variable.

   GVAR=variable number — The variable number to be used as the group variable.

PMAX=60/I	The maximum percentile value used for scanning of the percentized matrix.
PMIN=40/I	The minimum percentile value used for scanning of the percentized matrix.
NOSORT/SORT	Whether or not the input data has to be sorted. (If sorted the data must be ordered first by the SVAR variable, then by the GVAR variable.
INFI=IN/xxxx	Input data ddname suffix.
NODE/DECI	Whether or not deciles for each variable within each stratum should be computed and printed.

BADDATA=STOP/SKIP/MDI/MD2

When non-numeric characters (including imbedded blanks, &'s, and -'s and all-blank fields) are found in numeric variables, the program should:

STOP: Terminate the run.
SKIP: Skip the case.
MD1: Recode a full field of & to a full field of nines plus 1 (i.e., recode & to 10, && to 100, etc.). Recode a full field of - to a full field of nines plus 2 (i.e., recode 1 to 11, -- to 101, etc.). Recode all other non-numeric values to the first missing data code.

MD2: Recode full fields of & and - as specified in MD1 above. Recode all other non-numeric values to the second missing data code.

For SKIP, MD1, and MD2 a message is printed about the number of cases so treated.

MDATA=BOTH/MD1MD2/NONE	Eliminate cases from the analysis that have MD1, MD2, either (BOTH) missing-data values on any variables from the analysis. If missing-data is to be included NONE should be chosen.
NOPRED/PRED	Whether the RANKED PREDICTED CRITERION score mode is chosen.

MAST/NOMA/NORM	Indicates the input mode for the PERCENTILE SCORE CONSTRUCTION/SCANNING option. MAST indicates that the input data used in this job step is the MASTER NORMS data and that the following job step will use a NEW NORMS data set as input,' have the keyword NORM and be percentized according to the deciles established using the MASTER NORMS. NOMA means that the current job step has data that will be percentized according to its own deciles and not used to establish deciles for data from any subsequent job step. NORM indicates that a MASTER NORMS data set has already been used to generate deciles to be used for this step. The deciles are assumed to be stored on DSRN defined by ISAVE.
NORE/REGR	For the PREDICTED CRITERION SCORE (PRED keyword) mode only. REGR indicates that the simple regression coefficients have been calculated in a prior run and are stored in DSRN IN, arranged in strata/variable list order. NORE, the default, indicates that the simple regression coefficients are to be calculated.
NOST/STAN	For the PREDICTED CRITERION SCORE (PRED keyword) mode only. The keyword STAN indicates that the data will be standardized by the program before the regression coefficients are computed. NOST indicates that they will not be standardized by the program.

As an example of the use of these keywords, consider the following three job steps:

```
//    EXEC  OSIRIS
//DICTIN  DD  DSN=MASTERDI
//DATAIN  DD  DSN=MASTERDA
//DICTINA DD  DSN=NEWDI
//DATAINA DD  DSN=NEWDA
//DICTINB DD  DSN=DICT
```

```
        //DATAINB  DD   DSN=DATA
        //SETUP    DD   *
        $RUN PNORM
        $RECODE
           {    (Recode Statements)
        $SETUP
        INCLUDE V1=1 *
(1)     MASTER NORMS DATA (MALES ONLY)
        SVAR=2  GVAR=3  *
        V4-V10   *
        $END

        $RUN PNORM
        INCLUDE V1=1  *
(2)     NEW NORMS DATA (MALES ONLY)
        SVAR=2  GVAR=3  NORM  INFI=A  *
        V4-V10  *
        $END

        $RUN PNORM
        EXCLUDE V20=2  *
(3)     PERCENTIZING RUN ON NON-BLACKS (V
        SVAR=1   GVAR=2  NOMA  INFI=B  *
        V3-V10  *
        /*
```

In job step (1) the data sets MASTERDI and MASTERDA are used as MASTER NORMS data. After being filtered to include males only (INCLUDE V1=1 *), they are used to construct deciles for use in job step (2). Here the data sets NEWDI and NEWDA, assigned through the keyword INFI=A, are used as the NEW NORMS dictionary and data and percentized according to deciles established in job step (1).* In job step (3), the data sets DICT and DATA, assigned through the keyword INFI=B, are used to generate a percentized matrix, for the same data, as final output. A filter to include non-blacks (EXCLUDE V20=2*), is also used.

4. Variable List. Contains all norm variables. Also if the predicted criterion function is used and the SITE NORMS data is not being used, then the last variable indicated is used as the criterion variable in regression coeff. calculations.

---

*It should be remarked that there is a small amount of linear interpolation error associated with this procedure. Tests using the same data, a MASTER NORMS data set with 480 cases and a SITE NORMS data set of 125 cases on 3 NORM variables indicate errors of less than .01-.02 for the percentized matrix. An accuracy improvement for this procedure would be to use percentiles instead of deciles. Because of the additional CPU involved and the marginal accuracy improvement potential, deciles are presently used.

CREDITS

This program was originally designed by Robert C. Messenger of the Survey Research Center Computer Support Group (S.R.C.C.S.G.) and Mauricio Font of the Center for Research on the Utilization of Scientific Knowledge (C.R.U.S.K.), ISR, May, 1974. The program was written by Robert C. Messenger (S.R.C.C.S.G.). It uses standard OSIRIS input/output/sorting routines, developed and maintained by S.R.C.C.S.G., under the direction of Neal Van Eck (see ref. 2).

REFERENCES

1. "OSIRIS III: An Integrated Collection of Computer Programs for the Management and Analysis of Social Science Data," Institute for Social Research, University of Michigan, Ann Arbor, Michigan, 1973.

2. OSIRIS III Subroutine Manual, Institute for Social Research, The University of Michigan, Ann Arbor, Michigan, 1973.

JOB NO. 693490 UNIVERSITY OF MICHIGAN TERMINAL SYSTEM (MODEL CT124) 20:51.22 TUE OCT 15/74

MTS

SDHT

--------693490----------------693490----------------693490----------------693490----------------693490----------------693490-------

```
 0001           SUBROUTINE INPUT
          C
          C
          C
          C   *** MAIN PROGRAM
          C   *** READS CONTROL CARDS, INPUT DICTIONARY, DATA AND AGGREGATES BY
          C   *** GROUP
          C   *** DICTIONARY AND CONTROL CARD INTERPRETATION IS PRINTED
          C   *** AGGREGATED MATRIX STORED IN ADATA (REAL*4) ARRAY
          C   *** CALLS SORT, CARDS, SCALE, PTITLE, PTITL1, TEXT, GPIN AND
          C   *** SETKEY
          C
          C
          C
 0002           DIMENSION KEYLST(100),IVAL(15),ILOC(15)
 0003           DIMENSION LABEL(20),VE(20),ADATA(20?,30?),
               * VMO[illegible](20),VA[illegible](20)
 0004           DIMENSION NAME(4)
 0005           INTEGER IS(300),IOC(300),IDS(300)
 0006           INTEGER*2 LIST(220)
 0007           INTEGER ID,GMAX,SMAX,BLK
 0008           DATA ID/'IN  '/,BLK/'    '/,
               *  IOS/300*0/,IOS/300*0/
 0009           DATA KEYLST/4,'GVAR',1,0,4,'SVAR',1,10,4,'GMAX',1,50,4,'PRIN',1,40,2
               1,2,'ISO',4,0,'S',1,1,2,2,'ERPR',0,'PRIO',1,2,2,'NOCE',0,'DECI',1,
               * 2,3,'ASST',1,[illegible],2,'NCHS',2,1,'INFI',4,4,'PADC',4,
               * 'ST',1,1,'PRE',3,'PR2',5,'SKIP',7,4,'PCAT',4,
               * 'PRTI',0,'PRE',1,'PR2',2,'MODE',2,2,2,'NPRE',0,'REG',1,
               * 2,2,'POST',0,'STAR',1,0,'PRIN',1,'STAN'/
 0010           COMMON/IO/IN,ITEMP,IPRT,ISAVE
 0011           COMMON/PAR/SYIG,[illegible],ISTRAT,IPMAX,IPMIN,IFSORT,IFPAL,IFPRIN,IFMAST
               1,
               * IPRE,AG,IFSEC,IFSTAN,IFPS
 0012           COMMON NG,NS,ADATA,NV,LIST,NVT
          C
          C
 0013           ISCALE=0
 0014           GO TO 100
          C
          C     ENTRY FROM ISRSYS
          C
 0015           ENTRY ISRSYS(REC)
 0016           ISCALE=REC
 0017     100   CALL ISRSET
          C
          C     DEFINE I/O UNITS
          C
 0018           IN=7
 0019           ITEMP=3
 0020           ISAVE=4
 0021           IPRT=6
 0022           WRITE(IPRT,1100)
 0023     1100  FORMAT(1H1,'PROGRAM NCSR    OCTOBER 1974')
          C
          C     INITIALIZE
```

```
            C                                                              53.000
 0024             N=0                                                      54.000
 0025             NMC1 = 0                                                 54.000
 0026             NMC2 = 0                                                 55.000
 0027             DO 13 I=1,200                                            56.000
 0028             DO 13 J=1,300                                            57.000
 0029       13    RDATA(I,J) = 0.0                                         58.000
 0030             NC=C                                                     59.000
 0031             NS=C                                                     60.000
            C                                                              61.000
            C  FILTER                                                      62.000
            C                                                              63.000
 0032             CALL CFILT (LEVEL,C)                                     64.000
            C                                                              65.000
 0033             WRITE (IPRT,10)                                          66.000
 0034       10    FORMAT (1H1,20A4)                                        67.000
            C                                                              68.000
            C  KEYWORD PARAMETERS                                          69.000
            C                                                              70.000
 0035             NKEY=13                                                  71.000
 0036             CALL SETKEY (KEYES,ILOC,NKEY,0)                          72.000
 0037             CALL GETKEY (IVAL,ISTR,&200,&200)                        73.000
 0038             IGRCUP=IVAL(1)                                           74.000
 0039             ISTRAT=IVAL(2)                                           75.000
 0040             IMAX=IVAL(3)                                             76.000
 0041             IMIN=IVAL(4)                                             77.000
 0042             ISCRT=IVAL(5)                                            78.000
 0043             IPREC =IVAL(6)                                           79.000
 0044             IPRIN = IVAL(7)                                          80.000
 0045             IFMAST = IVAL(8)                                         81.000
 0046             IFAC = IVAL(13)                                          82.000
 0047             MC = IVAL(11)                                            83.000
 0048             IFREGR = IVAL(12)                                        84.000
 0049             IFSTAN = IVAL(13)                                        85.000
 0050             IFPS = IVAL(14)                                          85.250
 0051             IF(LIST(.NE.KEY) 0) = ISTR                               86.000
            C                                                              87.000
            C                                                              88.000
 0052             NV=ILIST(LIST)                                           94.000
 0053             LIST(NV+1) = ISTRAT                                      95.000
 0054             LIST(NV+2) = IGRCUP                                      96.000
 0055             NVT=NV+2                                                 97.000
 0056             CALL CGTDIC (DU,C,ITYPE,ISVN,IEVN,LIST,NVT,V,IRAD,       98.000
                 *  VMC1,VMC2,RECADD,220)                                  99.000
            C                                                              100.000
 0057             INDS = NV + 1                                            101.000
 0058             INDC = NV + 2                                            102.000
 0059             CALL GNAME(INDS,NAM)                                     103.000
            C  PARAMETERS                                                  104.000
            C                                                              105.000
 0060             WRITE(IPRT,40) NAM,ISTRAT                                106.000
 0061       40    FORMAT(1H1,'*** PARAMETER SPECIFICATION',///,            107.000
                 * ' STRATA VARIABLE IS ',5X,A4,5X,'VARIABLE NO.',I5)     108.000
 0062             CALL GNAME(INDG,NAM)                                     109.000
 0063             WRITE(IPRT,60) NAM,IGRCUP                                110.000
```

```
      60 FORMAT(1H ,' GROUP VARIABLE IS ',I3,2X,6A4,5X,
     *'MV SCALE ',I3,/)
         WRITE(IPRTR,70) IPMIN,IPMAX
      70 FORMAT(1H ,' MINIMUM PERCENTILE IS THE',I3,'TH',//,
     *' MAXIMUM PERCENTILE IS THE',I3,'TH')
         IF(IFSORT.NE.0) WRITE(IPRTR,110)
     110 FORMAT(1H ,' DATA HAS BEEN PRE-SORTED , FIRST BY STRATA , THEN GRO
     1UP')
         IF(IPRIN.NE.0) WRITE(IPRTR,120)
     120 FORMAT(1H ,' DECILE PRINT-OUT REQUESTED')
         IF(IPRED.NE.0) WRITE(IPRTR,130)
     130 FORMAT(1H ,' PREDICTED CRITERION SCORE MODE')
         IF(IPRED.EQ.0) WRITE(IPRTR,140)
     140 FORMAT(1H ,' PERCENTIZED SCORES MODE')
         IF(IFMAST.EQ.0) WRITE(IPRTR,150)
     150 FORMAT(1H ,' NON-MASTER DATA STRUCTURE')
         IF(IFMAST.EQ.1) WRITE(IPRTR,160)
     160 FORMAT(1H ,' MASTER DATA SET ')
         IF(IFMAST.EQ.2) WRITE(IPRTR,170)
     170 FORMAT(1H ,' NEW DATA SET')
         IF(IFAD.EQ.1) WRITE(IPRTR,270)
         IF(IFAD.EQ.3) WRITE(IPRTR,210)
         IF(IFAD.EQ.5) WRITE(IPRTR,220)
         IF(IFAD.EQ.7) WRITE(IPRTR,230)
     270 FORMAT(1H ,' BAD DATA WILL TERMINATE RUN')
     210 FORMAT(1H ,' BAD DATA WILL BE CHANGED TO MD1')
     220 FORMAT(1H ,' BAD DATA WILL BE CHANGED TO MD2')
     230 FORMAT(1H ,' BAD DATA WILL CAUSE CASE TO BE SKIPPED')
         IF(MC.EQ.0) WRITE(IPRTR,300)
         IF(MC.EQ.1) WRITE(IPRTR,310)
         IF(MC.EQ.2) WRITE(IPRTR,320)
         IF(MC.EQ.3) WRITE(IPRTR,330)
     300 FORMAT(1H ,' EITHER MISSING DATA CODE VALUE FOR ANY VARIABLE WILL
     1DELETE THE CASE')
     310 FORMAT(1H ,' MD1 VALUES FOR ANY VARIABLE WILL DELETE THE CASE')
     320 FORMAT(1H ,' MD2 VALUES FOR ANY VARIABLE WILL DELETE THE CASE')
     330 FORMAT(1H ,' ALL CASES KEPT REGARDLESS OF MISSING DATA VALUES')
C
C
C
       1 CALL CASE (I)
         IF(I.EQ.1) GO TO 50
         N=N+1
         IF(MC.EQ.3) GO TO 33
         DO 31 K=1,NV
         IF(MC.EQ.2) GO TO 32
         IF(V(K).NE.VMD1(K)) GO TO 32
         NMD1 = NMD1 + 1
         GO TO 1
      32 IF(MC.EQ.1) GO TO 31
         IF(V(K).LT.VMD2(K)) GO TO 31
         NMD2 = NMD2 + 1
         GO TO 1
      31 CONTINUE
      33 JG=V(NVT)
```

```
      JS=NV(NV+1)
      IF(NC.EQ.0) GO TO 2
C
      DO 3 I=1,NC
      IF(JC.EQ.ICC(I)) GO TO 4
    3 CONTINUE
C
    2 NC=NC+1
      I = NC
      ICG(NC) = JC
      ADATA(NV+1,NC)=JS
      ADATA(NVT,NC)=JC
      IF(NC.EQ.1)GO TO 21
    4 DO 6 K=1,NS
      IF(JS.EQ.IDS(K)) GO TO 7
    6 CONTINUE
C
   21 NS=NS+1
      IDS(NS) = JS
    7 ADATA(NVT+1,I)=ADATA(NVT+1,I)+1
C
      DO 5 J=1,NV
    5 ADATA(J,I)=ADATA(J,I)+V(J)
      GO TO 1
C
C
C
C
C
C
   50 CALL SCLOSE(0)
      WRITE (IPRTS,30)N,NS,NG
   30 FORMAT(1H0,'*** AFTER GLOBAL FILTERING',/,5X,
     *'SAMPLE SIZE =',I5/5X,'NO.OF STRATA =',I3/5X,'NO.OF GROUPS =',I3)
      NF = N - NRD1 -NRD2
      WRITE(IPRTS,400) NRD1,NRD2,NF
  400 FORMAT(1H0,'*** NO. OF CASES ELIMINATED BECAUSE OF RD1 =',I4,
     * //,'*** NO. OF CASES ELIMINATED BECAUSE OF RD2 =',I4,//,
     * '*** FINAL NO. OF CASES FOR ANALYSIS =',I5)
      DO 8 I=1,NC
      NGROUP=ADATA(NVT+1,I)
      DO 8 J=1,NV
    8 ADATA(J,I)=ADATA(J,I)/NGROUP
      IF(IFSORT.EQ.0) CALL SORT
      IF(IFP.EQ.0) GO TO 11
      IF(IFSTAN.EQ.1) CALL STAN
      IF(IF[illegible].EQ.0.AND.IFMAST.NE.2) CALL CORREL
      CALL SCALE
      CALL PTILE1
   11 IF(IFP.EQ.0) CALL PTILE
      CALL TEXT
      RETURN
  200 WRITE(IPRTS,20)
   20 FORMAT(1H1,'*** ERROR IN PARAMETER CARD,
     *  RUN TERMINATED')
```

```
0153      STOP 16                                    219.000
0154      END                                        220.000
```

COMMON BLOCK /ZED/ MAP SIZE 10

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
IN	0	ITEMP	4	IPNTR	8	ISAVE	C		

COMMON BLOCK /PARMS/ MAP SIZE 34

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
IGROUP	C	ISTRAT	4	IFMAX	8	IFMIN	C	IFSOFT	10
IFCHEC	14	IFPRIN	18	IFMAST	1C	IFAL	20	ND	24
IFKEGE	[illegible]	IFSTAN	2C	IFPS	30				

COMMON BLOCK / MAP SIZE 3995C

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
M	0	NG	4	NS	8	ACATA	C	NV	3B79C
LIST	3B7A0	NVT	39553						

SUBPROGRAMS CALLED

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
ISSSET	1C8	IOCCMS	1CC	GFILT	1D0	SETKEY	104	GETKEY	108
ILIST	1DC	GETDIC	1FC	GNAME	1E4	CASS	1F8	GCLOSE	1EC
SEL	1F0	STAN	1F4	CORHEL	1F3	SCALE	1FC	PTILE1	200
PTILE	204	TEXT	208						

SCALAR MAP

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
BP	27C	PLK	280	RECADD	294	REC	298	NMD1	2AC
NODE	290	I	294	J	298	NKEY	29C	ISTR	2A0
ITYPE	2A4	ISVN	2A8	IEVN	2AC	INCS	2B0	INDG	2B4
K	2B8	JS	2BC	JS	2C0	KF	2C4	NGROUP	2C8

ARRAY MAP

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
KEYLS	2CC	IVAL	45C	ILOC	458	LABEL	404	V	524
VMD1	E54	VMD2	CC4	NAM	F74	IS	F8C	IDG	143C
IDS	195C								

FORMAT STATEMENT MAP

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
1010	1D3C	10	1D8F	40	1DC8	60	1E1C	70	1E4F
110	1E3A	120	1ED4	130	1EFC	140	1F22	150	1F40
160	1F60	170	1F79	270	1F9D	210	1FB0	220	1FD7
230	1FFF	300	202C	310	2078	320	20A0	330	20E8
340	2120	400	217F	77	2211				

OPTIONS IN EFFECT ID,EBCDIC,SOURCE,NOLIST,NODECK,LOAD,MAP
OPTIONS IN EFFECT NAME = INPUT , LINECNT = 57
STATISTICS SOURCE STATEMENTS = 154,PROGRAM SIZE = 11866
STATISTICS NO DIAGNOSTICS GENERATED

```
      SUBROUTINE STAN
C
C
C
C     *** STANDARDIZES AGGREGATED DATA MATRIX
C     *** USED IN PREDICTED CRITERION MODE ONLY
C     *** COMPUTES MEANS, STD. DEV. WITHIN STRATA
C     *** STD. SCORE = (SCORE - MEAN) / STD. DEV.
C     *** CALLED BY INPUT
C
C
C
      DIMENSION ADATA(203,200)
      INTEGER*2 LIST(203)
      COMMON /IO/ IN,ITEMP,IPRTR,ISAVE
      COMMON N,NG,NS,ADATA,NV,LIST,NVT
      COMMON/PARMS/IGROUP,ISTRAT,IPMAX,IPMIN,IFSCRT,IFPRED,IFPRIN,IFMAST
     1,
     * IPAC,MC,IFREGR,IFSTAN,IFPS
      INOS =ADATA(NV+1,1)
      IS = 1
C
      DO 1  IP=2,NG
      IF(INOS.EQ.ADATA(NV+1,IP)) GO TO 1
      IE = IP- 1
      CALL TRANS(IS,IE)
      IS = IP
      INOS = ADATA(NV+1,IP)
    1 CONTINUE
C
      CALL TRANS(IS,NG)
C
      IF(IFPS .EQ. 0) GO TO 200
      NSTAR = 1
   50 NSTOP = NSTAR + 9
      KNT = 0
      IF(NSTOP.GT.NV) NSTOP = NV
C
      DO 2  I=1,NG
      IS = ADATA(NV+1,I)
      IC = ADATA(NVT,I)
      IF = ADATA(NV+2,I)
      IF(KNT .NE. 0) GO TO 110
      WRITE(IPRTR,113) (LIST(KK),  KK=NSTAR,NSTOP)
  113 FORMAT(1H1,'*** LISTING OF STANDARDIZED MATRIX',///,'STRATA',5X,'G
     1ROUP',
     *  5X,'FREQUENCY',1X,'VARIABLE NOS.',10I9,/)
      KNT = 5
  110 WRITE(IPRTR,120) IS,IC,IF,(ADATA(J,I),  J=NSTAR,NSTOP)
  120 FORMAT(1H ,I4,I12,I12,20X,10F9.2)
      KNT = KNT + 1
      IF(KNT .GE. 60) KNT = 0
    2 CONTINUE
C
      NSTAR = NSTOP + 1
```

```
0036          IF(NSTAR.LE.NVI) GO TO 40                                          269.000
0037      200 RETURN                                                             270.000
0038          END                                                                271.000
```

COMMON BLOCK /IO/   / MAP SIZE   10

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
IN	0	ITEMP	4	IPRTR	8	ISAVE	C		

COMMON BLOCK /   / MAP SIZE   3395C

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
N	0	NG	4	NS	8	ADATA	C	NV	3E79C
LIST	397AC	KNT	3955F						

COMMON BLOCK /PARMS   / MAP SIZE   34

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
IGROUP	0	ISTRAT	4	IPMAX	8	IPMIN	C	IFSORT	10
IFPREC	14	IFPRIN	18	IFNAST	1C	IPAE	20	MD	24
IFNFOP	28	IFSTAN	2C	IFPS	30				

SUBPROGRAMS CALLED

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
TRANS	84	IBCCM#	CC						

SCALAR MAP

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
IPOS	100	IS	104	IP	108	IE	10C	NSTAR	110
NSTOP	114	KNT	118	I	11C	IG	120	IF	124
KK	128	J	12C						

FORMAT STATEMENT MAP

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
110	130	120	190						

```
*OPTIONS IN EFFECT*  ID,EBCDIC,SOURCE,NOLIST,NODECK,LOAD,MAP
*OPTIONS IN EFFECT*  NAME = STAN     , LINECNT =        57
*STATISTICS*    SOURCE STATEMENTS =        38,PROGRAM SIZE =     1272
*STATISTICS*  NO DIAGNOSTICS GENERATED
```

```
MICHIGAN TERMINAL SYSTEM FORTRAN G(41336)        TRANS        10-15-74        20:57.11        PAGE P001

                                                                           272.000
 0001          SUBROUTINE TRANS(IS,IF)                                     273.000
         C                                                                 274.000
         C                                                                 275.000
         C                                                                 276.000
         C     *** COMPUTES AND REVISES ADATA ARRAY BY STRATA              277.000
         C     *** CALLED BY STAR                                          278.000
         C                                                                 279.000
         C                                                                 280.000
         C                                                                 281.000
 0002          DIMENSION ADATA(200,200)                                    282.000
 0003          DIMENSION AMEAN(200),STDDEV(200)                            283.000
 0004          INTEGER*2 LIST(2,3)                                         284.000
 0005          COMMON N,NG,NS,STRATA,NV,LIST,NVT                           285.000
 0006          NGS = IF - IS + 1                                           286.000
 0007          DO 1  I=1,NV                                                287.000
 0008          DO 2  J=1,NV                                                288.000
 0009          AMEAN(J) = 0.                                               289.000
 0010    2     STDDEV(J) = 0.                                              290.000
 0011          DO 3  K=IS,IF                                               291.000
 0012          STDDEV(I) = STDDEV(I) + ADATA(I,K)**2                       292.000
 0013    3     AMEAN(I) = AMEAN(I) + ADATA(I,K)                            293.000
 0014          AMEAN(I) = AMEAN(I)/NGS                                     294.000
 0015          STDDEV(I) = SQRT(STDDEV(I)/NGS - AMEAN(I)**2)               295.000
 0016          DO 4  L=IS,IF                                               296.000
 0017          IF(STDDEV(I).EQ.0.) STDDEV(I) = 1.0                         297.000
 0018          ADATA(I,L) = (ADATA(I,L) - AMEAN(I))/STDDEV(I)              298.000
 0019    4     CONTINUE                                                    299.000
 0020    1     CONTINUE                                                    300.000
 0021          RETURN                                                      301.000
 0022          END
```

```
MICHIGAN TERMINAL SYSTEM FORTRAN G(41336)          TRANS          10-15-74          20:52.01          PAGE 0002

                                  COMMON BLOCK /       / MAP SIZE   3835C
SYMBOL     LOCATION     SYMBOL     LOCATION     SYMBOL     LOCATION     SYMBOL     LOCATION     SYMBOL     LOCATION
N                 0     KS                4     NS                8     ADATA             C     NV            3C7BC
LIST          3B7AC     NVT           3B558

                                  SUBPROGRAMS CALLED
SYMBOL     LOCATION     SYMBOL     LOCATION     SYMBOL     LOCATION     SYMBOL     LOCATION     SYMBOL     LOCATION
SQRT             AC

                                  SCALAR MAP
SYMBOL     LOCATION     SYMBOL     LOCATION     SYMBOL     LOCATION     SYMBOL     LOCATION     SYMBOL     LOCATION
NCS              94     IE               98     IS               9C     I                C0     J                C4
K                C8     L                CC

                                  ARRAY MAP
SYMBOL     LOCATION     SYMBOL     LOCATION     SYMBOL     LOCATION     SYMBOL     LOCATION     SYMBOL     LOCATION
AMEAN            D0     STDDEV          1E0

     *OPTIONS IN EFFECT*  ID,EBCDIC,SOURCE,NOLIST,NODECK,LOAD,MAP
     *OPTIONS IN EFFECT*  NAME = TRANS    , LINECNT =       57
     *STATISTICS*    SOURCE STATEMENTS =        22,PROGRAM SIZE =       2354
     *STATISTICS*  NO DIAGNOSTICS GENERATED
```

```
      SUBROUTINE SORT
C
C
C *** SORTS AGGREGATED DATA MATRIX
C *** SORT DONE FIRST BY STRATA , THEN BY GROUP
C *** DATASET DEFINED BY ITEMP CONTAINS UNSORTED ARRAY ADATA
C *** PRINTS AGGREGATED MATRIX
C *** CALLED BY INPUT
C
C
C
      DIMENSION ADATA (200,200),STRGRP(2,200)
      INTEGER PLEN
      INTEGER*2 TAG(200)
      INTEGER*2 LIST(220)
      COMMON/IO/IN,ITEMP,IPRTR,ISAVE
      COMMON N,NG,NS,ADATA,NV,LIST,NVT
C
C
      NVT1 = NVT + 1
C
C *** COPY STRATA AND GROUP VARIABLES INTO STRGRP ARRAY
C
      DO 2  I=1,NG
      TAG(I) = I
      STRGRP(1,I) = ADATA(NV+1,I)
    2 STRGRP(2,I) = ADATA(NVT,I)
C
C *** CALL CSIRIS SORT ROUTINE
C
      CALL RADIX(STRGRP,NG,8,1,8,2,TAG,2)
C
C
C *** COPY ADATA MATRIX ON DISK
      DO 3  I=1,NG
    3 WRITE(ITEMP) (ADATA(J,I),  J=1,NVT1)
      ENDFILE ITEMP
      REWIND ITEMP
C *** OVERLAY ADATA WITH ORDERED ROWS
C
      DO 4  I=1,NG
      IND = TAG(I) - 1
      IF(IND.EQ.0) GO TO 25
      DO 5  J=1,IND
      READ(ITEMP)
    5 CONTINUE
   25 READ(ITEMP) (ADATA(K,I),  K=1,NVT1)
    4 REWIND ITEMP
C
      ISTAR = 1
  100 ISTOP = ISTAR + 9
      KNT = 0
      IF(ISTOP.GT.NV) ISTOP = NV
      DO 1 I=1,NG
```

MICHIGAN TERMINAL SYSTEM FORTRAN G(41336)   SORT   10-15-74   20:52.05   PAGE P002

```
0031              IS = IDATA(NV+1,I)                               362.000
0032              IC = IDATA(NVT,I)                                363.000
0033              INN = ADATA(NVT+1,I)                             364.000
0034              IF(KNT .NE. 0) GO TO 1100                        364.010
0035        120   WRITE(IPRTR,10)(LIST(KK),KK=ISTAR,ISTOP)         364.100
0036        10    FORMAT(1H1,'*** DISLOCATED DATA ***',//,5X,      364.200
                 *'STRATA',5X,'GROUP',5X,'SIZE',10I10////)         364.300
0037              KNT = 5                                          364.310
            C                                                      364.400
0039        1100  WRITE(IPRTR,20) IS,IC,INN,                       365.000
                 * (ADATA(K,I), K=ISTAR,ISTOP)                     366.000
0039        20    FORMAT(' ',I4,I11,I10,1X,10F10.2)                367.000
0040              KNT = KNT + 1                                    367.250
0041              IF(KNT .GE. 60) KNT= 0                           367.500
0042        1     CONTINUE                                         369.000
            C                                                      369.000
0043              ISTAR = ISTOP + 1                                370.000
0044              IF(ISTAR.LE.NVT) GO TO 100                       371.000
            C                                                      372.000
0045              RETURN                                           373.000
0046              END                                              374.000
```

COMMON BLOCK /IO/ MAP SIZE 10

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
IN	0	ITEMP	4	IPRTR	8	ISAVE	C		

COMMON BLOCK / / MAP SIZE 3895C

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
N	0	NG	4	NS	8	ACATA	C	NV	3879C
LIST	387A0	KVT	38958						

SUBPROGRAMS CALLED

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
RADIX	6C	IBCOM#	70						

SCALAR MAP

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
KVT1	114	I	118	J	11C	IAP	120	K	124
ISTAR	128	ISTOP	12C	KNT	130	IS	134	IG	138
INF	13C	KK	140						

ARRAY MAP

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
STOPP	144	TAG	4A4						

FORMAT STATEMENT MAP

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
10	EFC	20	D3E						

```
*OPTIONS IN EFFECT*  ID,EBCDIC,SOURCE,NOLIST,NODECK,LOAD,MAP
*OPTIONS IN EFFECT*  NAME = SCAT     , LINECNT =      57
*STATISTICS*    SOURCE STATEMENTS =        46,PROGRAM SIZE =      4452
*STATISTICS*  NO DIAGNOSTICS GENERATED
```

```
0001          SUBROUTINE PTILE
         C
         C
         C
         C    *** EXTRACTS SUBSCRIPTS OF GROUPS BELONGING TO EACH STRATA
         C    *** PRINTS PERCENTIZED DATA ARRAY BY STRATA/GROUP ORDERING
         C    *** CALLS PCENT
         C    *** CALLED BY INPUT
         C
         C
         C
0002          DIMENSION ADATA (203,200)
0003          INTEGER*2 LIST(220)
0004          COMMON/IC/IN,ITEMP,IPRTF,ISAVE
0005          COMMON N,NG,NS,ADATA,NV,LIST,NVT
         C
         C
0006          REWIND ISAVE
0007          INDS =ADATA(NV+1,1)
0008          IS = 1
         C
0009          DO 1  IP=2,NG
0010          IF(INDS.EQ.ADATA(NV+1,IP)) GO TO 1
0011          IE = IP- 1
0012          CALL PCENT(IS,IE)
0013          IS = IP
0014          INDS = ADATA(NV+1,IP)
0015     1    CONTINUE
         C
0016          CALL PCENT(IS,NG)
         C
0017          NSTAR = 1
0018    60    NSTOP = NSTAR + 9
0019          KNT = 0
0020          IF(NSTOP.GT.NV) NSTOP = NV
         C
0021          DO 2  I=1,NG
0022          IS = ADATA(NV+1,I)
0023          IG = ADATA(NVT,I)
0024          IF = ADATA(NV+2,I)
0025          IF(KNT .NE. 0) GO TO 119
0026          WRITE(IPRTF,110) (LIST(KK),  KK=NSTAR,NSTOP)
0027   110    FORMAT(1H1,'*** LISTING OF PERCENTIZED MATRIX',///,'STRATA',5X,'GR
             1OUP',
             *  5X,'FREQUENCY',3X,'VARIABLE NOS.',10I8,/)
0028          KNT = 5
0029   119    WRITE(IPRTF,120) IS,IG,IF,(ADATA(J,I),  J=NSTAR,NSTOP)
0030   120    FORMAT(1H ,I4,I11,I12,20X,10F8.2)
0031          KNT = KNT + 1
0032          IF(KNT .GE. 40) KNT= 0
0033     2    CONTINUE
         C
0034          NSTAR = NSTOP + 1
0035          IF(NSTAR.LE.NV) GO TO 60
0036          ENDFILE ISAVE
```

```
0057    RETURN    429.000
0058    END       430.000
```

COMMON BLOCK /10/ MAP SIZE 10

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
IP	0	ITEMP	4	IPNTR	8	ISAVE	C		

COMMON BLOCK / / MAP SIZE 3B35C

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
N	0	NG	4	NS	8	ADATA	C	NV	3B79C
LIST	3B7AC	KNT	3B5BF						

SUBPROGRAMS CALLED

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
IPCOM*	D8	FCONT	DC						

SCALAR MAP

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
ITHS	F0	IS	F4	IP	F8	IE	FC	NSTAR	100
NSTEP	104	KNT	108	I	10C	IC	110	IF	114
KK	118	J	11C						

FORMAT STATEMENT MAP

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
110	120	120	174						

```
*OPTIONS IN EFFECT*  ID,EBCDIC,SOURCE,NOLIST,NODECK,LOAD,MAP
*OPTIONS IN EFFECT*  NAME = PTILE    , LINECNT =      57
*STATISTICS*    SOURCE STATEMENTS =       34,PROGRAM SIZE =      1264
*STATISTICS*  NO DIAGNOSTICS GENERATED
```

```
      SUBROUTINE CORREL
C
C
C
C     *** COMPUTES SIMPLE REGRESSION COEFF.
C     *** USED ONLY IN PREDICTED CRITERION MODE
C     *** CALLED BY INPUT
C     *** CALLS XPROD
C
C
C
      DIMENSION ADATA(20,300)
      INTEGER*2 LIST(220)
      COMMON /IO/IN,ITEMP,IPRTR,ISAVE
      COMMON N,NG,NS,ADATA,NV,LIST,NVT
      REWIND IN
      INDS =ADATA(NV+1,1)
      IS = 1
C
      DO 1  IP=2,NG
      IF(INDS.EQ.ADATA(NV+1,IP)) GO TO 1
      IF = IP- 1
      CALL XPROD(IS,IF)
      IS = IP
      INDS = ADATA(NV+1,IP)
    1 CONTINUE
C
      CALL XPROD(IS,NG)
      ENDFILE IN
      REWIND IN
      RETURN
      END
```

```
                   COMMON BLOCK /IO       / MAP SIZE     10
 LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION
     0      ITEMP       4       IPRTR       8       ISAVE       C

                   COMMON BLOCK /         / MAP SIZE   3B95C
 LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION
     0      NS          4       KS          8       ADATA       C       NV        3B790
  3B7A0     NVT       2055C

                   SUBPROGRAMS CALLED
 LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION
    AC      APROD      BC

                   SCALAR MAP
 LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION
    C4      IS         C8       IP         CC       IE         D0

*OPTIONS IN EFFECT*  ID,EBCDIC,SOURCE,NOLIST,NODECK,LOAD,MAP
*OPTIONS IN EFFECT*  NAME = COSROL  , LINECNT =       57
*STATISTICS*     SOURCE STATEMENTS =       20,PROGRAM SIZE =     612
*STATISTICS*  NO DIAGNOSTICS GENERATED
```

```
TERMINAL SYSTEM / FORTRAN G(41336)          XPR          10-14-76          21:57.27          PAGE P.03
      SUBROUTINE XPR(IS,IF)
C
C
C
C     *** COMPUTES SINGLE REGRESSION COEFF.
C     *** WRITES ON DISK(IN)
C     *** CALLED BY CONTEL
C
C
C
      DIMENSION ADATA(200,300),XP(200)
      INTEGER*2 LIST(200)
      COMMON /IO/IN,ITEMP,IEETR,ISAVC
      COMMON N,NC,PS,ADATA,NV,LIST,NVT
      NV1 = NV - 1
      NCS = IF - IS + 1
      DO 1  I=1,NV1
    1 XP(I) = C.
      DO 2  I=1,NV1
      DO 2  J=IS,IF
    2 XP(I) = XP(I) + ADATA(NV,J)*ADATA(I,J)
      DO 3  K=1,NV1
    3 XP(K) = XP(K)/NCS
      WRITE(IN) (XP(I),  I=1,NV1)
      RETURN
      END
```

```
[illegible] SYSTEM FORTRAN [illegible]      XREFD      10-15-74      20.52.15      PAGE 0002

              [illegible] BLOCK /        / MAP SIZE    10
LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION
   0       ITEMP       4       IDETP       8       ISAVE       C

              COMMON BLOCK /             / MAP SIZE    3B35C
LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION
   0       NG          4       NS          8       ADATA       C       NV       3B79C
 3B7A0     NVT      3B3EB

              SUBPROGRAMS CALLED
LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION
   B0

              SCALAR MAP
LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION
   B4      NGS        B8       IE          BC      IS          C0      I          C4
   C8      K          CC

              ARRAY MAP
LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION
   D0

[illegible]S IN EFFECT*  ID,EBCDIC,SOURCE,NOLIST,NODECK,LOAD,MAP
[illegible]S IN EFFECT*  NAME = XREFD   , LINECNT =      57
[illegible]TICS*   SOURCE STATEMENTS =        17,PROGRAM SIZE =      1500
[illegible]TICS*  NO DIAGNOSTICS GENERATED
```

```
      SUBROUTINE PCENTL(IS,IE)
C
C
C
C     *** SORTS DATA FOR EACH VARIABLE WITHIN STRATA
C     *** COMPUTES AND PRINTS DECILES (OPTIONAL)
C     ** WRITES DECILES ON ISAVE DSN IF MASTER DATASET
C     *** CALLS RADIX AND PAGE
C     *** CALLED BY PTILE
C
C
C
      DIMENSION ADATA(205,300)
      DIMENSION ITAG(300)
      DIMENSION SORTV(300)
      DIMENSION PINC(10),DEC(9),IDEC(9)
      INTEGER*2 LIST(200)
      COMMON /IO/ IN,ITTYP,IPRTR,ISAVE
      COMMON/PARMS/ICALIP,ISTRAT,IPMAX,IPMIN,IFSORT,IFPRED,IFPAIR,IFMAST
     1,
     * IFAC,NC,IFREQ,IFSTAN,IFPC
      COMMON N,NC,NS,ADATA,NV,LIST,NVT
C
C
      NVT1 =NVT + 1
      KNT = 0
      DO 3  I=1,9
    3 IDEC(I) = 1
C
C
      DO 1  I=1,NV
      IVAR = LIST(I)
      N = 0
C
      DO 2  J=IS,IE
      N = N + 1
      ITAG(N) = N
    2 SORTV(N) = ADATA(I,J)
C
C
      CALL RADIX(SORTV,N,4,1,4,2,ITAG,4)
      ISTRST = ADATA(NVT1,IS)
      MIN = ITAG(1)
      VMIN = ADATA(I,IS+MIN-1)
      MAX = ITAG(N)
      VMAX = ADATA(I,IS+MAX-1)
      IF(IFPRIN.EQ.0.AND.IFMAST.EQ.0) GO TO 30
C
C     *** COMPUTE DECILES
C
      DO 7  II=1,9
      PINC(II) = ((N-1)/10.) * II + 1
      INC = PINC(II)
    7 DEC(II) = SORTV(INC) + (PINC(II)-INC)*(SORTV(INC+1)-SORTV(INC))
C
```

```
      IF(IFMAST.EQ.1) WRITE(ISAVE) VMIN,DEC,VMAX
      IF(KNT .NE. 0) GO TO 15
      IF(IFPRIN.NE.0) WRITE(IPRT,50) IDEC
   50 FORMAT(1H1,*** DECILE PRINTOUT*,//,* STRATA*,3X,*VARIABLE*,
     * 3X,*MINIMUM*,3X,*MAXIMUM*,7X,*10*/)
      KNT = 5
C
   15 IF(IFPRIN.NE.0) WRITE(IPRT,20) (STRAT,IVAR,VMIN,VMAX,DEC
   20 FORMAT(* *,I4,I10,2X,2F10.2,6X,9F8.2)
      KNT = KNT + 1
      IF(KNT .GE. 60) KNT = 0
C
   30 IF(IFMAST.EQ.2) CALL MACH(I,IS,IE)
      IF(IFMAST.EQ.2) GO TO 1
C
      DO 8 II=IS,IE
      JINC = ITAB(II-IS+1) + IS - 1
      IF(N.EQ.1) P = .5
      IF(N.EQ.1) GO TO 8
      P = 1.0*(II-IS)/(N-1)
    8 ADATA(I,JIND) = P
C
    1 CONTINUE
C
C
C
      RETURN
      END
```

COMMON BLOCK /[illegible]/ MAP SIZE 1C

LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
0	ITEMP	4	IOSTD	8	ISAVE	C		

COMMON BLOCK /PARMS / MAP SIZE 34

LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
0	ISTRAT	4	IFMAX	8	IPRIN	C	IFSORT	10
14	IFPRIN	18	IFMAST	1C	IPAL	20	MO	24
28	IFSTAN	2C	IFPS	30				

COMMON BLOCK / / MAP SIZE 3845C

LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
0	NS	4	NS	8	ECATA	C	NV	3E79C
3E7A0	NVT	3E7A4						

SUBROUTINES CALLED

LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
FC	IBCOM#	100	VACHD	104				

SCALAR MAP

LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
124	KNT	128	I	13C	IVAL	140	J	144
148	IF	14C	MIN	150	VMIN	154	MAX	158
15C	II	160	IND	164	JIND	168	P	16C

ARRAY MAP

LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
170	SORTV	620	PIND	AD0	CEC	AF8	IDEC	B1C

FORMAT STATEMENT MAP

LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
040	20	35E						

OPTIONS IN EFFECT IC,EBCDIC,SOURCE,NOLIST,NODECK,LOAD,MAP
OPTIONS IN EFFECT NAME = FCENT , LINECNT = 57
STATISTICS SOURCE STATEMENTS = 51,PROGRAM SIZE = 4326
STATISTICS NO DIAGNOSTICS GENERATED

```
      SUBROUTINE MACHC(I,IS,IE)                                         572.000
C                                                                       573.000
C                                                                       574.000
C                                                                       575.000
C *** READS DECILES FROM ISAVE BASED ON NATIONAL NORMS                  576.000
C *** CONVERTS NEW SCORES TO PERCENTILES USING LINEAR INTERPOLATION     577.000
C *** CALLED BY PCENT                                                   578.000
C                                                                       579.000
C                                                                       580.000
C                                                                       581.000
      DIMENSION ADATA(200,200),AMAST(11)                                582.000
      INTEGER*2 LIST(200)                                               583.000
      COMMON /IO/ IN,ITEMP,IPRT,ISAVE                                   584.000
      COMMON/PARMS/IGROUP,ISTAT,IPMAX,IPMIN,IFSCRT,IFPRED,IFPRIN,IFMAST 585.000
     1,                                                                 586.000
     * IFRE,NC,IFERROR,IFSTAN,IFRS                                      586.000
      COMMON NG,NS,ADATA,NV,LIST,NVT                                    587.000
C                                                                       588.000
C                                                                       589.000
      READ(ISAVE) (AMAST(J), J=1,11)                                    590.000
C                                                                       591.000
C *** CHECK FOR VALUES OUTSIDE DECILE RANGE                             592.000
      DO 3 J=IS,IE                                                      593.000
      IF(ADATA(I,J).GT.AMAST(1)) GO TO 11                               594.000
      ADATA(I,J) = 0.                                                   595.000
      GO TO 3                                                           596.000
   11 IF(ADATA(I,J).LT.AMAST(11)) GO TO 12                              597.000
      ADATA(I,J) = 1.0                                                  598.000
      GO TO 3                                                           599.000
C                                                                       600.000
C                                                                       601.000
   12 DO 4 K=2,11                                                       602.000
      IF(ADATA(I,J).GT.AMAST(K)) GO TO 4                                603.000
      FRACT = (ADATA(I,J) - AMAST(K-1)) / (AMAST(K) - AMAST(K-1))       604.000
      FRACT = 0.1*FRACT                                                 605.000
      ADATA(I,J) = (K-2)/10. + FRACT                                    606.000
      GO TO 3                                                           607.000
    4 CONTINUE                                                          608.000
C                                                                       609.000
    3 CONTINUE                                                          610.000
C                                                                       611.000
      RETURN                                                            612.000
      END                                                               613.000
```

```
MTS  TERMINAL SYSTEM FORTRAN G(41336)        MACHC         10-15-74     20:52.36      PAGE 7002

              COMMON BLOCK /1/        / MAP SIZE       10
   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION
       0      ITEMP        4      IPTR         8      ISAVE        C

              COMMON BLOCK /PARMS     / MAP SIZE       34
   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION
       0      ISTRAT       4      IPMAX        8      IPMIN        C      IFSORT      10
      14      IPMIN       18      IFMAST      1C      IFAC        20      MD          24
      28      IFSTAN      2C      IFPS        30

              COMMON BLOCK /          / MAP SIZE    3679C
   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION
       0      NG           4      NS           8      ADATA        C      NV        3679C
   28790      NVT      2F7E8

              SUBPROGRAMS CALLED
   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION
      E8

              SCALAR MAP
   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION
      E0      IS          E0      IP          E4      I           E8      K           EC
      F0

              ARRAY MAP
   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION
      F4

*OPTIONS IN EFFECT*  ID,EBCDIC,SOURCE,NOLIST,NODECK,LOAD,MAP
*OPTIONS IN EFFECT*  NAME = MACHC    , LINECNT =       57
*STATISTICS*    SOURCE STATEMENTS =        24,PROGRAM SIZE =        344
*STATISTICS*  NO DIAGNOSTICS GENERATED
```

```
      SUBROUTINE SCALE
C
C
C
C     *** GENERATES SCORES FOR PREDICTED CRITERION SCORE MODE
C     *** READS REGRESSION COEFFS. FROM DRRN *IN*
C     *** CALLED BY INPUT
C
C
C
      DIMENSION SCALE(200),ADATA(203,200)
      INTEGER*2 LIST(200)
      COMMON /IO/ IN,ITEMP,IPRTR,ISAVE
      COMMON/PARMS/IGROUP,ISTAT,IPMAX,IFMIN,IFSORT,IFPRED,IFPRIN,IFPAST
     1,
     * IFAL,MD,IERROR,IESTAR,IFPS
      COMMON N,NG,NS,ADATA,NV,LIST,NVT
C
C
C
      NV1 = NV - 1
      IF(IFPAST.EQ.2) NV1 = NV
      JS = 0
      IS = ADATA(NV+1,1)
      DO 1  I=1,200
      IF(I.GT.NG) GO TO 100
      INS = ADATA(NV+1,I)
      IF(INS.EQ.IS.AND.I.NE.1) GO TO 150
      READ(IN,END=100) (SCALE(J),  J=1,NV1)
      IS = INS
      JS=JS + 1
  150 DO 1  K=1,NV1
      ADATA(K,I) = ADATA(K,I)*SCALE(K)
    1 CONTINUE
  100 IF(I.NE.NG+1) GO TO 200
      NSTAR = 1
   60 NSTOP = NSTAR + 9
      KNT = 0
      IF(NSTOP.GT.NV) NSTOP = NV
C
      DO 2  I=1,NG
      IS = ADATA(NV+1,I)
      IC = ADATA(NVT,I)
      IF = ADATA(NV+2,I)
      IF(KNT .NE. 0) GO TO 119
      WRITE(IPRTR,110) (LIST(KK),  KK=NSTAR,NSTOP)
  110 FORMAT(1H1,'*** LISTING OF PRED. CRIT. SCORES',///,'STRATA',5X,'GR
     1OUP',
     *  5X,'FREQUENCY',3X,'VARIABLE NOS.',/,10I8,//)
      KNT = 5
  119 WRITE(IPRTR,120) IS,IC,IF,(ADATA(J,I),  J=NSTAR,NSTOP)
  120 FORMAT(1H ,I4,I11,I12,20X,10F8.2)
      KNT = KNT + 1
      IF (KNT .GE. 60) KNT = 0
    2 CONTINUE
```

```
C
      NSTRT = NSTCF + 1
      IF(NSTAR.LE.NVI C  TO 60
      IF(JS.NE.NS) GO TO 500
      REWIND IN
      RETURN
C
200   WRITE(IPRT,210) I
210   FORMAT('1','*** INCORRECT NO. OF SCALING RECORDS','  I=',I4)
C
500   WRITE(IPRT,510) JS
  510 FORMAT(1H1,'*** INCORRECT NO. OF SCALING RECORDS, NO. OF STRATA PE
     1RDS =',I4)
      STOP
      END
```

```
... SYSTEM ... SCALE                         10-15-74        20:52.30        PAGE 2003

                  COMMON BLOCK /T/          / MAP SIZE        10
LOCATION    SYMBOL    LOCATION    SYMBOL    LOCATION    SYMBOL    LOCATION    SYMBOL    LOCATION
   0        ITEMP        4        IPRTR        8        ISAVE        C

                  COMMON BLOCK /PARMS  /    / MAP SIZE        34
LOCATION    SYMBOL    LOCATION    SYMBOL    LOCATION    SYMBOL    LOCATION    SYMBOL    LOCATION
   0        ISTRAT       4        IPMAX        8        IFMIN        C        IFSORT      10
  14        IFPRIN      18        IFMAST      1C        IPAD        20        MO          24
  28        IFSTAV      2C        IFPS        30

                  COMMON BLOCK /            / MAP SIZE     3B75C
LOCATION    SYMBOL    LOCATION    SYMBOL    LOCATION    SYMBOL    LOCATION    SYMBOL    LOCATION
   0        NS           4        KS           8        ACATA        C        NV       2B79C
3B7A0       KNT       3A5E8

                  SUBPROGRAMS CALLED
LOCATION    SYMBOL    LOCATION    SYMBOL    LOCATION    SYMBOL    LOCATION    SYMBOL    LOCATION
 10C

                  SCALAR MAP
LOCATION    SYMBOL    LOCATION    SYMBOL    LOCATION    SYMBOL    LOCATION    SYMBOL    LOCATION
 110        JS         114        IS         118        I          11C        IPS        120
 124        K          128        KSTAR      12C        KSTEP      130        KNT        134
 138        IP         13C        KK         140

                  ARRAY MAP
LOCATION    SYMBOL    LOCATION    SYMBOL    LOCATION    SYMBOL    LOCATION    SYMBOL    LOCATION
 144

                  FORMAT STATEMENT MAP
LOCATION    SYMBOL    LOCATION    SYMBOL    LOCATION    SYMBOL    LOCATION    SYMBOL    LOCATION
 4A4         120       4C3         210       4C5         510       508

...IONS IN EFFECT*  ID,EBCDIC,SOURCE,NOLIST,NODECK,LOAD,MAP
...IONS IN EFFECT*  NAME = SCALE    , LINECNT =      57
...ISTICS*   SOURCE STATEMENTS =      40,PROGRAM SIZE =      2480
...ISTICS*  NO DIAGNOSTICS GENERATED
```

```
                                                                        680.000
0001         SUBROUTINE FTILE?                                          681.000
           C                                                            682.000
           C                                                            683.000
           C    *** GENERATES PERCENTILES IN PREDICTED CRITERION SCORE MODE 684.000
           C    *** SORTS CRITERION SCORES WITHIN GROUPS AND REPLACES BY PERCENTILES 685.000
           C    *** CALLS RADSIX                                        686.000
           C    *** CALLED BY INPUT                                     687.000
           C                                                            688.000
           C                                                            689.000
           C                                                            690.000
0002         INTEGER*2 LIST(320)                                        691.000
0003         DIMENSION ADATA(33,300)                                    692.000
0004         DIMENSION ITAG(320),SORTV(320)                             693.000
0005         DIMENSION GREN(5),IGPR(13)                                 694.000
0006         COMMON/PARMS/IGROUP,ISTEPT,IFMAX,IFMIN,IFSCHT,IFPRED,IFPRIN,IFMAST 695.000
            1,                                                          696.000
            *ITIME,NC,IFREQ,IESTAN,IFPS                                 697.000
0007         COMMON /IO/ IN,ITAPE,IPRTR,ISAVE                           698.000
0008         COMMON N,NG,NS,ADATA,NV,LIST,NVT                           699.000
           C                                                            700.000
           C                                                            700.100
0009         KNT = 0                                                    700.250
0010         ISP = NVT - 1                                              701.000
0011         IF(IFMAST.NE.2) NV = NV - 1                                704.000
0012         DO 5  I=1,5                                                705.000
0013       5 IGPR(I) = 1                                                707.000
           C                                                            710.000
0014         DO 1  I=1,NC                                               711.000
           C  *** LOAD SORT ARRAY SORTV                                 712.000
0015         DO 2  J=1,NV                                               713.000
0016         SORTV(J) = ADATA(J,I)                                      714.000
0017       2 ITAG(J) = J                                                715.000
           C  *** CALL USERS SORT ROUTINE                               716.000
0018         CALL RADIX(SORTV,NV,4,1,4,2,ITAG,4)                        717.000
           C *** RE-ASSIGN ADATA VALUES PERCENTILE SCORES               718.000
0019         DO 4  K=1,5                                                719.000
0020         PIND = ((NV-1)/20.) * K + 1                                720.000
0021         IND = PIND                                                 721.000
0022         IL = ITAG(IND)                                             722.000
0023         IH = ITAG(IND+1)                                           723.000
0024       4 GREN(K) = ADATA(IL,I) + (PIND-IND)*(ADATA(IH,I) - ADATA(IL,I)) 724.000
           C                                                            724.250
0025         IF(IFPRIN .EQ. 0) GO TO 300                                725.000
0026         IS = ADATA(NVT-1,I)                                        726.000
0027         IC = ADATA(NVT,I)                                          727.000
0028         MIN = ITAG(1)                                              728.000
0029         VMIN = ADATA(MIN,I)                                        729.000
0030         MAX = ITAG(NV)                                             730.000
0031         VMAX = ADATA(MAX,I)                                        731.000
0032         MINV = LIST(MIN)                                           732.000
0033         MAXV = LIST(MAX)                                           732.001
0034         IF(KNT .NE. 0) GO TO 35                                    732.010
0035         WRITE(IPRTR,30) IGPR                                       732.100
0036      30 FORMAT(1H1,'STRATA',3X,'GROUP',3X,'MIN. VAR.',3X,'VALUE',3X,
```

```
     * VMAX, VAR,',3X,'VALUE',3X,-I7//)
      KNT = 3
   35 WRITE(IPATC,40) IS,IG,MINV,VMIN,MAXV,VMAX,CPER
   40 FORMAT(1H ,I4,I9,I10,F13.2,I7,F12.2,5X,SF7.2)
      KNT = KNT + 1
      IF(KNT .GE. 60) KNT = 0
C
  300 DO 3  K=1,NV
      JINC = ITAG(K)
    3 ZDATA(JINC,I) = 1.0*(K-1)/(NV-1)
    1 CONTINUE
      NSTAR = 1
   60 NSTOP = NSTAR + 5
      IF(NSTOP.GT.NV) NSTOP = NV
      KNT = 0
C
      DO 7  I=1,NC
      IS = SDATA(ISP,I)
      IC = SDATA(NVT,I)
      IF = SDATA(NVT+1,I)
      IF(KNT .NE. 0) GO TO 119
      WRITE(IPATA,110) (LIST(KK),  KK=NSTAR,NSTOP)
  110 FORMAT(1H1,'*** LISTING OF PERCENTIZED MATRIX',///,'STRATA',5X,'GR
     1OUP',
     *  5X,'FREQUENCY',3X,'VARIABLE NOS.',6I10,/)
      KNT = 5
  119 WRITE(IPRT2,120) IS,IC,IF,(ADATA(J,I),  J=NSTAR,NSTOP)
  120 FORMAT(1H ,I4,I11,I12,20X,10F8.2)
      KNT = KNT + 1
      IF(KNT .GE. 60) KNT = 0
    7 CONTINUE
C
      NSTAR = NSTOP + 1
      IF(NSTAR.LE.NV) GO TO 60
      RETURN
      END
```

COMMON BLOCK /PA[illegible]S / MAP SIZE 34

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
[illegible]	0	ISTRAT	4	IPMAX	8	IPMIN	C	IESORT	10
[illegible]	14	IPRHIN	1[illegible]	IFMAST	1C	IEAC	20	MO	24
[illegible]	2[illegible]	IESTAB	2C	IFPS	30				

COMMON BLOCK /IO/ MAP SIZE 10

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
[illegible]	[illegible]	ITEMP	4	IPETR	8	ISAVE	C		

COMMON BLOCK / / MAP SIZE 3395C

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
[illegible]	0	NS	4	KS	8	ADATA	C	NV	3F75C
[illegible]ST	3F7A0	ANT	3F7[illegible]						

SUBPROGRAMS CALLED

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
[illegible]IX	1[illegible]	IPERM[illegible]	10[illegible]						

SCALAR MAP

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
[illegible]	1[illegible]	ISP	12C	I	130	J	134	K	138
[illegible]	1[illegible]	I[illegible]	14[illegible]	II	144	IF	148	IS	14C
[illegible]	150	MIN	154	VMIN	158	MAX	15C	VMAX	160
[illegible]	164	MAXV	16[illegible]	JIND	16C	NSTAS	170	NSTOP	174
[illegible]	17[illegible]	IF	17C	KK	1[illegible]				

ARRAY MAP

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
[illegible]	[illegible]	SORTV	A24	OPER	AF4	ICPER	B03		

FORMAT STATEMENT MAP

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
[illegible]0	[illegible]	40	476	110	8[illegible]0	120	REF		

```
*OPTIONS IN EFFECT*  ID,EBCDIC,SOURCE,NOLIST,NODECK,LOAD,MAP
*OPTIONS IN EFFECT*  NAME = PTILE1  , LINECNT =        57
*STATISTICS*     SOURCE STATEMENTS =        [illegible],PROGRAM SIZE =      4716
*STATISTICS*  NO DIAGNOSTICS GENERATED
```

```
 01         SUBROUTINE TEXT
      C
      C
      C
      C    *** SCANS PERCENTIZED MATRIX ... WITH NORMS (PERCENTIZED NORMS AND
      C PREDICTED CRITERION SCORES)
      C    *** EXTRACTS EXTREME NORMS (OR VARIABLES) BASED ON PMIN , PMAX
      C KEYWORD VALUES
      C    *** SORTS EXTREMES INTO ASCENDING ORDER
      C    *** PRINTS EXTREMES FOR EACH GROUP
      C
      C
      C
 0002       DIMENSION ADATA(...,...)
 0003       INTEGER*2 LIST(200),NVLOW(200),NVHIGH(200)
 0004       DIMENSION FHIGH(200),FLOW(200)
 0005       COMMON /IO/ IN,ITEMP,IPRT,ISAVE
 0006       COMMON/PARMS/IGROUP,ISTAT,IOMAX,IPMIN,IESORT,IPRED,IPPIN,IPAST
           1,
           * IPAL,MC,IFIERS,IESTAN,IEES
 0007       COMMON N,NC,NS,ADATA,PV,LIST,NVT
      C
      C
 0008       WRITE(IPRT,20)
 0009    20 FORMAT(1H1,'*** LISTING OF NORM EXTREMES BY GROUP',/,
           * ' RANK ORDERING BY PERCENTILE MAGNITUDE')
 0010       PMIN = IPMIN/100.
 0011       PMAX = IPMAX/100.
 0012       ISP = NVT - 1
      C
 0013       DO 1  J=1,NS
 0014       INDL = 0
 0015       INDH = 0
      C
 0016       DO 2  I=1,NV
 0017       IF(ADATA(I,J).GE.PMIN) GO TO 3
 0018       INDL = INDL + 1
 0019       NVLOW(INDL) = LIST(I)
 0020       FLOW(INDL) = ADATA(I,J)
 0021     3 IF(ADATA(I,J).LE.PMAX) GO TO 2
 0022       INDH = INDH + 1
 0023       NVHIGH(INDH) = LIST(I)
 0024       FHIGH(INDH) = ADATA(I,J)
 0025     2 CONTINUE
      C
 0026       TS = ADATA(ISP,J)
 0027       TC = ADATA(NVT,J)
 0028       TF = ADATA(NVT+1,J)
 0029       IF(INDL.NE.0.OR.INDH.NE.0) WRITE(IPRT,30) TS,TC,TF
 0030    30 FORMAT(1H-,///,'*** STRATA NO.',I3,5X,'GROUP NO.',I5,5X,
           * 'SAMPLE SIZE =',I4)
 0031       IF(INDL.NE.0) CALL SALIX(FLOW,INDL,4,1,4,2,NVLOW,2)
 0032       IF(INDL.NE.0) WRITE(IPRT,50) (NVLOW(K),FLOW(K), K=1,INDL)
 0033    50 FORMAT(1H0,'*** LOW SCORES',//,T20,'VARIABLE NUMBER',T40
           * ,'PERCENTILE',/,(T25,I5,T42,F5.3))
```

94

```
          IF(INDH.NE.0) CALL [illegible](.....,NDH,4,1,..2,NVHIGH,2)          812.000
 [ill]    IF(INSCH.NE.0) WRITE(..) ...(IVHIGH(K),PHIGH(K), K=1,INDH)          813.000
 [ill] 40 FORMAT(1H0,'*** HIGH SCORES',//,T20,'VARIABLE NUMBER',T40,           814.000
         *'PERCENTILE',/,(T25,I5,T42,F5.3))                                   815.000
 0037  1  CONTINUE                                                            816.000
       C                                                                      817.000
 0038     RETURN                                                              818.000
 0039     END                                                                 819.000
```

```
                         COMMON BLOCK /[illegible]/    / MAP SIZE    10
SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION
IN          0       ITEMP       4       I[illegible]     8       ISAVE       C

                         COMMON BLOCK /PARMS /   / MAP SIZE    34
SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION
I[illegible]     0       ISTRAT      4       IPMAX       8       IFMIN       C       IFSORT     10
I[illegible]    14       IF[illegible]     18       IFMAST     1C       IFAC       20       MD         24
I[illegible]    28       IFSTAN     2C       IFPS       30

                         COMMON BLOCK /      / MAP SIZE    3B45C
SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION
N           0       NS          4       NS          4       ACATA       C       NV       3[illegible]79C
LIST     3[illegible]7[illegible]C       NVT      3H5[illegible]8

                         SUBPROGRAMS CALLED
SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION
I[illegible]      [illegible]C      RADIX      FC

                         SCALAR MAP
SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION
[illegible]      [illegible]4      FMAX       [illegible]8      ISP        12C      J          13[illegible]     INOL       13[illegible]
I[illegible]     1[illegible]       I          1[illegible]C      IS         14[illegible]      IG         144      IF         148
K          14C

                         ARRAY MAP
SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION
NVL        15[illegible]      NHIGH      [illegible]C       PHIGH      470      PLOW       7[illegible]

                         FORMAT STATEMENT MAP
SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION   SYMBOL   LOCATION
  20       [illegible]         30      8C8         50      841         40       8A8

*OPTIONS IN EFFECT*  ID,EBCDIC,SOURCE,NOLIST,NODECK,LOAD,MAP
*OPTIONS IN EFFECT*  NAME = TEXT     , LINECNT =      57
*STATISTICS*    SOURCE STATEMENTS =     [illegible],PROGRAM SIZE =      3364
*STATISTICS*  NO DIAGNOSTICS GENERATED

[illegible] STATEMENTS FLAGGED IN THE ABOVE COMPILATIONS.
```

6S3400

SDHT

Appendix B

Sample Printouts of the Calculator and Prioritizer Functions

MTS

SDHT

```
***** 10-OCT-74  DUE TO ITS HARDWARE PROBLEMS, THE PROGRAMS MVP, NTILE, REGR, AND    *****
***** SCIMVR WERE TEMPORARILY UNAVAILABLE.  THEY SHOULD NOW ALL BE O-KAY             *****
```

```
                    INSTITUTE FOR SOCIAL RESEARCH MONITOR SYSTEM      02/01/74

*****LISTING OF SETUP FOLLOWS:

CARD           1         2         3         4         5         6         7         8
 NO.  1234567890123456789012345678901234567890123456789012345678901234567890123456789O
  1   RUN NAME
  2   TEST RUN
  3   CVAR=3 SVAR=6 DSC1  *
  4   V1-V12*
  5   GENDFILE
```

GVAR=3 SVAR=6 DEC1 •

THE VARIABLE LIST IS:

V10-V12•

	VAR.	TYPE	VARIABLE NAME	TLOC	WIDTH	NDEC	RESP.	MDCODE1	MDCODE2	REFNO	ID	TSEQNO
T	3	0	WORK GROUP NO.	10	5	0	1	0099999				00000
T	6	0	2-DIGIT CLASS	28	2	0	1	0000099				00000
T	10	0	10 CO HAS CLEAR GOALS	33	1	0	1	0000009	0000006			00000
T	11	0	11 WK ACTIVITY ORGANIZED	34	1	0	1	0000009	0000006			00000
T	12	0	12 YOU GET OTH UNIT INFO	35	1	0	1	0000009	0000 06			00000

```
*** [illegible] SPECIFICATION

STUDY VARIABLE IS :    2-DIGIT CLASS              VARIABLE NO.   6
GROUP VARIABLE IS :    WORK GROUP NO.             VARIABLE NO.   3
MINIMUM PERCENTILE IS THE 40TH

MAXIMUM PERCENTILE IS THE 80TH
DECILE PRINT-OUT REQUESTED
[illegible] MODE
MASTER DATA SET
BAD DATA WILL TERMINATE RUN
EITHER MISSING DATA CODE VALUE FOR ANY VARIABLE WILL DELETE THE CASE

*** AFTER GLOBAL FILTERING
    SAMPLE SIZE =  480
    NO. OF STRATA =  5
    NO. OF GROUPS = 57

*** NO. OF CASES ELIMINATED BECAUSE OF MD1 =   3

*** NO. OF CASES ELIMINATED BECAUSE OF MD2 =   0

*** FINAL NO. OF CASES FOR ANALYSIS =  477
```

*** [illegible] CATCH DATA ***

STRATA	GROUP	SIZE	10	11	12
0	150	5	4.00	4.20	3.40
0	355	5	3.40	3.60	2.80
0	1045	1	4.00	5.00	3.00
0	1180	2	2.50	2.00	1.50
0	1165	7	2.86	2.57	2.43
0	1200	8	4.12	3.50	2.37
0	1275	5	3.40	3.20	2.80
0	1225	8	3.37	3.75	3.50
2	75	5	3.60	3.20	2.80
2	155	4	3.50	3.75	2.00
2	177	5	4.00	3.60	3.40
2	250	7	4.00	3.43	2.71
2	265	3	4.33	4.00	4.00
2	345	3	3.33	3.00	2.67
2	370	4	3.75	3.75	2.50
2	410	6	3.33	3.33	2.67
2	455	1	4.00	3.00	2.00
2	530	11	3.19	3.18	3.19
2	625	8	3.37	3.62	3.00
2	675	12	3.79	3.42	3.42
2	740	11	3.00	3.00	2.27
2	855	7	3.14	3.29	3.14
2	970	3	2.33	2.33	3.00
2	1100	9	3.11	3.11	3.11
2	1170	12	3.50	3.00	2.17
2	1250	3	4.33	4.00	3.00
2	1260	6	3.83	3.83	2.50
2	1290	7	3.43	3.71	2.43
2	1300	17	3.06	3.00	2.29
2	1440	6	3.33	3.67	3.33
2	1405	5	4.00	4.00	4.00
2	1455	6	3.33	3.33	3.50
2	1520	3	3.33	3.00	2.67
2	1560	3	4.33	4.33	3.67
2	1600	9	4.00	3.78	3.78
2	1540	1	3.00	3.00	1.00
2	1630	2	3.50	4.50	4.00
2	1655	2	4.00	4.00	3.50
2	1775	5	3.00	3.40	3.00
2	1811	7	3.43	2.86	2.57
2	1821	6	3.50	3.50	3.00
2	1860	4	4.50	4.00	2.75
2	1970	6	4.17	3.33	3.50
2	2025	7	3.86	3.71	3.14
2	2095	6	3.33	3.33	3.50
2	2130	2	4.50	4.50	3.00
2	2146	5	3.60	3.20	2.40
2	2155	7	3.43	3.29	3.43
2	2240	2	4.00	4.00	4.00
2	2251	6	4.17	3.33	3.17
2	2405	4	3.25	3.75	2.25
3	25	5	3.60	4.00	2.80
3	90	4	2.50	1.50	2.00
3	140	2	4.00	4.00	3.50
3	240	4	3.50	3.50	3.00

*** [illegible] [illegible]ATED DATA ***

STRATA	GROUP	SIZE	10	11	12
3	400	1	[illegible]	[illegible]	4.00
3	475	5	3.30	2.80	[illegible]
3	490	5	3.40	3.60	1.20
3	500	5	3.20	2.60	2.60
3	525	2	2.00	2.00	3.00
3	555	1	5.00	5.00	4.00
3	930	6	4.00	2.17	2.17
3	965	9	3.22	3.22	3.11
3	1030	6	3.67	3.17	3.67
3	1050	5	3.60	3.40	2.50
3	1155	1	3.00	1.00	1.00
3	1210	3	3.67	4.33	3.33
3	1225	5	4.00	4.00	3.60
3	1240	10	3.60	3.50	2.50
3	1245	8	3.37	3.50	2.37
3	1335	7	4.14	2.86	4.14
3	1345	1	4.00	4.00	3.00
3	1350	3	3.67	3.67	4.33
3	1465	3	4.33	4.00	3.33
3	1555	4	4.25	3.50	3.75
3	1770	5	4.20	3.60	4.00
3	1955	2	4.00	3.50	3.00
3	1960	1	4.00	4.00	3.00
3	2115	2	4.00	4.00	3.50
3	2080	6	3.83	3.50	2.67
3	2120	2	2.50	3.00	2.50
3	2330	5	3.40	3.20	3.00
3	2340	2	4.50	3.50	3.50
3	2345	5	3.60	2.80	2.40
4	10	5	3.50	3.60	4.00
4	20	2	4.00	4.00	3.50
4	235	4	4.00	4.00	3.50
4	470	5	2.80	3.00	3.00
4	455	2	3.50	3.50	3.50
4	520	6	4.00	4.00	3.67
4	935	4	3.75	3.50	3.25
4	1325	9	3.67	3.22	2.22
4	1425	2	4.00	4.00	4.00
4	1330	3	3.33	3.33	4.33
[illegible]	1554	1	4.00	4.00	4.00
[illegible]	[illegible]	1	3.00	4.00	2.00
[illegible]	[illegible]	2	4.50	4.00	4.00

[illegible] PRINTOUT

STRATA	VARIABLE	MINIMUM	MAXIMUM	1	2	3	4	5	6	7	8	9
0	10	2.50	4.12	2.75	3.04	3.16	3.39	3.40	3.52	3.94	4.00	4.04
0	11	2.00	5.00	2.40	2.82	3.23	3.44	3.55	3.63	3.73	4.02	4.44
0	12	1.50	3.50	2.11	2.40	2.47	2.73	2.80	2.84	2.98	3.24	3.43

PERCENTILE OUTPUT

STRATA	VARIABLE	MINIMUM	MAXIMUM	1	2	3	4	5	6	7	8	9
2	10	[illegible]	4.53	3.07	3.28	3.33	3.49	3.60	3.83	4.00	4.00	4.30
2	11	1.75	4.50	3.00	3.00	3.19	3.32	3.42	3.68	3.79	3.93	4.00
2	12	1.00	4.00	2.25	2.46	2.67	2.79	3.00	3.14	3.42	3.50	3.82

*** DECILE PRINTOUT

STRATA	VARIABLE	MINIMUM	MAXIMUM	1	2	3	4	5	6	7	8	9
3	10	2.00	5.00	3.04	3.38	3.46	3.60	3.67	3.87	4.00	4.00	4.24
3	11	1.00	5.00	2.60	2.88	3.10	3.22	3.50	3.50	3.74	4.00	4.00
3	12	1.00	4.33	2.03	2.44	2.64	2.96	3.00	3.16	3.50	3.64	4.00

[illegible] PRINTOUT

STRATA	VARIABLE	MINIMUM	MAXIMUM	1	2	3	4	5	6	7	8	9
4	10	2.60	4.[illegible]	2.38	3.27	3.52	3.64	3.71	3.65	4.00	4.00	4.00
4	11	3.00	4.[illegible]	3.20	3.31	2.45	3.50	3.55	3.76	4.00	4.00	4.00
4	12	2.22	4.33	2.92	3.20	3.42	3.50	3.50	3.57	3.77	4.00	4.00

*** DECILE PRINTOUT

STRATA	VARIABLE	MINIMUM	MAXIMUM	1	2	3	4	5	6	7	8	9
99	10	3.00	4.50	3.20	3.40	3.60	3.80	4.00	4.10	4.20	4.30	4.40
99	11	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
99	12	2.00	4.00	2.40	2.80	3.20	3.60	4.00	4.00	4.00	4.00	4.00

*** LISTING OF PERCENTIZED VALUES

STRATA	GROUP	FREQUENCY	VARIABLE NOS.	10	11	12
0	350	5		0.71	0.86	0.86
0	355	5		0.43	0.57	0.57
0	1045	1		0.86	1.00	0.71
0	1180	2		0.0	0.0	0.0
0	1195	7		0.14	0.14	0.29
0	1200	8		1.00	0.43	0.14
0	1275	5		0.57	0.29	0.43
0	1285	8		0.29	0.71	1.00
2	75	5		0.52	0.33	0.40
2	155	4		0.43	0.0	0.02
2	178	5		0.79	0.71	0.83
2	250	7		0.83	0.52	0.36
2	225	3		0.90	0.86	1.00
2	365	3		0.31	0.12	0.33
2	370	4		0.55	0.67	0.24
2	410	6		0.21	0.45	0.29
2	425	1		0.41	0.19	0.05
2	570	11		0.17	0.29	0.67
2	605	8		0.67	0.57	0.52
2	645	13		0.57	0.50	0.69
2	750	11		0.35	0.24	0.12
2	850	7		0.14	0.38	0.62
2	970	3		0.0	0.02	0.48
2	1160	5		0.12	0.26	0.57
2	1170	12		0.45	0.21	0.07
2	1250	3		0.93	0.88	0.43
2	1240	6		0.61	0.76	0.21
2	1280	7		0.38	0.62	0.19
2	1300	17		0.10	0.10	0.14
2	1360	6		0.76	0.60	0.90
2	1403	5		0.75	0.50	0.98
2	1445	6		0.62	0.43	0.76
2	1500	3		0.24	0.17	0.31
2	1570	3		0.55	0.93	0.86
2	1600	9		0.71	0.65	0.88
2	1640	1		0.32	0.14	0.0
2	1660	2		0.40	1.00	0.33
2	1655	2		0.45	0.83	0.74
2	1778	5		0.37	0.49	0.55
2	1811	7		0.36	0.07	0.26
2	1961	6		0.49	0.59	0.45
2	1990	4		1.00	0.81	0.38
2	1970	6		0.85	0.79	0.31
2	2025	7		0.64	0.64	0.40
2	2056	6		0.29	0.43	0.79
2	2130	2		0.94	0.58	0.50
2	2165	5		0.53	0.31	0.17
2	2205	7		0.33	0.36	0.71
2	2240	2		0.74	0.55	0.95
2	2271	6		0.89	0.74	0.66
2	2405	4		0.13	0.05	0.10
3	25	5		0.25	0.28	0.34
3	33	4		0.36	0.03	0.09
3	140	2		0.67	0.54	0.75
3	340	4		0.34	0.47	0.47

[illegible] LISTING OF PERCENTILIZED MATRIX

STRATA	GROUP	FREQUENCY	VARIABLE NOS.	10	11	12
3	400	1		0.03	0.91	0.91
3	475	5		0.56	0.16	0.06
3	480	5		0.53	0.09	0.03
3	500	5		0.13	0.13	0.28
3	525	7		0.0	0.06	0.56
3	575	1		1.00	1.00	0.94
3	900	6		0.72	0.31	0.13
3	965	5		0.16	0.41	0.59
3	1020	6		0.44	0.34	0.91
3	1050	5		0.22	0.44	0.38
3	1055	1		0.03	0.0	0.0
3	1210	3		0.47	0.97	0.66
3	1235	5		0.66	0.88	0.78
3	1240	10		0.41	0.72	0.22
3	1245	8		0.19	0.56	0.16
3	1335	7		0.84	0.72	0.97
3	1345	1		0.63	0.78	0.53
3	1350	3		0.50	0.69	1.00
3	1445	3		0.34	0.75	0.43
3	1555	4		0.91	0.59	0.84
3	1770	5		0.89	0.66	0.89
3	[illegible]	2		0.73	0.53	0.50
3	[illegible]	1		0.91	0.81	0.41
3	[illegible]	2		0.75	0.94	0.72
3	2065	6		0.50	0.40	0.31
3	2130	2		0.31	0.25	0.25
3	[illegible]	5		0.28	0.38	0.44
3	[illegible]	2		0.97	0.53	0.69
3	2345	5		0.34	0.19	0.12
4	10	5		0.33	0.56	0.78
4	20	2		1.00	1.00	0.56
4	275	4		0.78	0.78	0.33
4	470	5		0.0	0.0	0.11
4	[illegible]	2		0.11	0.44	0.44
4	520	4		0.67	0.67	0.67
4	[illegible]	4		0.56	0.33	0.22
4	1125	5		0.44	0.11	0.0
4	[illegible]	2		0.83	0.89	0.39
4	[illegible]	3		0.22	0.22	1.00
[illegible]	1554	1		0.50	0.0	0.50
[illegible]	2310	1		0.0	0.50	0.0
[illegible]	[illegible]	2		1.00	1.00	1.00

[illegible]
[illegible] BY PERCENTILE [illegible]

*** STRATA NO. 0 GROUP NO. [illegible] SAMPLE SIZE = 5

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.714
11	0.857
12	0.857

*** STRATA NO. 0 GROUP NO. 10[illegible] SAMPLE SIZE = 1

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.714
10	0.857
11	1.000

*** STRATA NO. 0 GROUP NO. 1140 SAMPLE SIZE = 2

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.0
11	0.0
12	0.0

*** STRATA NO. 0 GROUP NO. 1165 SAMPLE SIZE = 7

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.143
11	0.143
12	0.286

*** STRATA NO. 0 GROUP NO. 1200 SAMPLE SIZE = 8

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.143

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	1.000

*** STRATA NO. 3 GROUP NO. 1235 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.286

*** STRATA NO. 3 GROUP NO. 1255 SAMPLE SIZE = 8

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
13	[illegible]

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.714
12	1.000

*** STRATA NO. 2 GROUP NO. 75 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.333

*** STRATA NO. 2 GROUP NO. 155 SAMPLE SIZE = 4

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.0
12	0.024

*** STRATA NO. 2 GROUP NO. 176 SAMPLE SIZE = 5

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.714
10	0.786
12	0.823

*** STRATA NO. 2 GROUP NO. 250 SAMPLE SIZE = 7

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.357

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	[illegible]

*** STRATA NO. 2 GROUP NO. 285 SAMPLE SIZE = 3

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.667
10	0.555
12	1.000

*** STRATA NO. 2 GROUP NO. 345 SAMPLE SIZE = 3

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.11[illegible]
10	0.[illegible]10
12	0.[illegible]33

*** STRATA NO. 2 GROUP NO. 370 SAMPLE SIZE = 4

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.298

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.667

*** STRATA NO. 2 GROUP NO. 410 SAMPLE SIZE = 6

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.214
12	0.298

*** STRATA NO. 2 GROUP NO. 435 SAMPLE SIZE = 1

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.048
11	0.150

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.810

*** STRATA NO. 2 GROUP NO. [illegible] SAMPLE SIZE = 11

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.167
11	[illegible]

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.667

*** STRATA NO. 2 GROUP NO. 435 SAMPLE SIZE = 8

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.447

*** STRATA NO. 2 GROUP NO. 465 SAMPLE SIZE = 19

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.450

*** STRATA NO. 2 GROUP NO. 330 SAMPLE SIZE = 11

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.048
12	0.119
11	0.238

*** STRATA NO. 2 GROUP NO. 450 SAMPLE SIZE = 7

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.143
11	0.381

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.419

*** STRATA NO. 2 GROUP NO. 570 SAMPLE SIZE = 3

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.0
11	0.024

*** STRATA NO. 2 GROUP NO. 1100 SAMPLE SIZE = 6

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.119
11	0.262

*** STRATA NO. 2 GROUP NO. 1170 SAMPLE SIZE = 12

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.071
11	0.214

*** STRATA NO. 2 GROUP NO. 1250 SAMPLE SIZE = 3

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.941
10	0.929

*** STRATA NO. 2 GROUP NO. 1260 SAMPLE SIZE = 6

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.214

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.762

*** STRATA NO. 2 GROUP NO. 1290 SAMPLE SIZE = 7

*** LOW SCORES

VARIABLE NUMBER PERCENTILE

12	0.190
13	0.381

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.619

*** STRATA NO. 2 GROUP NO. 1300 SAMPLE SIZE = 17

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.095
11	0.095
12	0.143

*** STRATA NO. 2 GROUP NO. 1360 SAMPLE SIZE = 6

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.262

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.905

*** STRATA NO. 2 GROUP NO. 1403 SAMPLE SIZE = 6

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.762
11	0.905
12	0.976

*** STRATA NO. 2 GROUP NO. 1458 SAMPLE SIZE = 6

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.619

12 0.7[illegible]

*** STRATA NO. 2 GROUP NO. 1500 SAMPLE SIZE = 3

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.147
10	0.23[illegible]
12	0.[illegible]10

*** STRATA NO. 2 GROUP NO. 1560 SAMPLE SIZE = 3

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.857
11	0.[illegible]
10	0.95[illegible]

*** STRATA NO. 2 GROUP NO. 1[illegible] SAMPLE SIZE = 9

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.[illegible]
10	0.714
12	0.[illegible]

*** STRATA NO. 2 GROUP NO. 1[illegible] SAMPLE SIZE = 1

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.0
10	[illegible]
11	0.143

*** STRATA NO. 2 GROUP NO. 1[illegible] SAMPLE SIZE = 2

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	[illegible]
11	1.000

*** STRATA NO. 2 GROUP NO. 1655 SAMPLE SIZE = 2

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.690
12	0.778
11	0.833

*** STRATA NO. 2 GROUP NO. 1775 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.071

*** STRATA NO. 2 GROUP NO. 1811 SAMPLE SIZE = 7

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.071
12	0.262
10	0.357

*** STRATA NO. 2 GROUP NO. 1900 SAMPLE SIZE = 4

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.381

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.810
10	1.000

*** STRATA NO. 2 GROUP NO. 1970 SAMPLE SIZE = 6

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.786
12	0.810
10	0.857

*** STRATA NO. 2 GROUP NO. 2025 SAMPLE SIZE = 7

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.643
11	0.643

*** STRATA NO. 2 GROUP NO. 2056 SAMPLE SIZE = 6

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.286

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.786

*** STRATA NO. 2 GROUP NO. 2130 SAMPLE SIZE = 2

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.976
11	0.976

*** STRATA NO. 2 GROUP NO. 2144 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.167
11	0.310

*** STRATA NO. 2 GROUP NO. 2225 SAMPLE SIZE = 7

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
13	0.286
11	0.257

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.714

*** STRATA NO. 2 GROUP NO. 2240 SAMPLE SIZE = 2

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.738
11	0.952
12	0.952

*** STRATA NO. 2 GROUP NO. 2291 SAMPLE SIZE = 6

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.643
11	0.738
13	0.881

*** STRATA NO. 2 GROUP NO. 2435 SAMPLE SIZE = 4

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.048
12	0.095
13	0.190

*** STRATA NO. 3 GROUP NO. 25 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.250
11	0.[illegible]1
12	0.344

*** STRATA NO. 3 GROUP NO. 30 SAMPLE SIZE = 4

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.0[illegible]1
10	0.0[illegible]
12	0.0[illegible]4

*** STRATA NO. 3 GROUP NO. 140 SAMPLE SIZE = 2

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.[illegible]
12	0.750
11	0.[illegible]

*** STRATA NO. 3 GROUP NO. 240 SAMPLE SIZE = 4

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.344

*** STRATA NO. 3 GROUP NO. 440 SAMPLE SIZE = 1

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.[illegible]

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.500
12	0.500

*** STRATA NO. 3 GROUP NO. 475 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.043
11	0.196

*** STRATA NO. 3 GROUP NO. 490 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.021
11	0.094

*** STRATA NO. 3 GROUP NO. 500 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.125
11	0.125
12	0.271

*** STRATA NO. 3 GROUP NO. 525 SAMPLE SIZE = 2

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.0
11	0.063

*** STRATA NO. 3 GROUP NO. 555 SAMPLE SIZE = 1

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
14	[illegible]
11	1.000
13	1.000

*** STRATA NO. 3 GROUP NO. 93[illegible] SAMPLE SIZE = 6

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.375
11	0.313

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.719

*** STRATA NO. 3 GROUP NO. 965 SAMPLE SIZE = 9

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
13	0.1[illegible]

*** STRATA NO. 3 GROUP NO. 1030 SAMPLE SIZE = 6

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.344

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.813

*** STRATA NO. 3 GROUP NO. 1090 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE

10	0.219
12	0.275

*** STRATA NO. 3 GROUP NO. 1055 SAMPLE SIZE = 1

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.0
11	0.0
10	0.094

*** STRATA NO. 3 GROUP NO. 1210 SAMPLE SIZE = 3

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.094
11	0.969

*** STRATA NO. 3 GROUP NO. 1235 SAMPLE SIZE = 5

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.656
12	0.781
11	0.875

*** STRATA NO. 3 GROUP NO. 1240 SAMPLE SIZE = 10

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.219
12	0.219

*** STRATA NO. 3 GROUP NO. 1245 SAMPLE SIZE = 8

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.156
10	0.188

*** STRATA NO. 3 GROUP NO. 1335 SAMPLE SIZE = 7

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.719
10	0.844
12	0.969

*** STRATA NO. 3 GROUP NO. 1345 SAMPLE SIZE = 1

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	[illegible]
11	0.781

*** STRATA NO. 3 GROUP NO. 1350 SAMPLE SIZE = 3

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	[illegible]
12	1.000

*** STRATA NO. 3 GROUP NO. 1445 SAMPLE SIZE = 3

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	[illegible]
11	0.750
10	[illegible]

*** STRATA NO. 3 GROUP NO. 1555 SAMPLE SIZE = 4

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.944
10	0.906

*** STRATA NO. 3 GROUP NO. 1770 SAMPLE SIZE = 5

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.656
10	0.875
12	0.875

*** STRATA NO. 3 GROUP NO. 1855 SAMPLE SIZE = 2

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.625
10	0.781

*** STRATA NO. 3 GROUP NO. 1550 SAMPLE SIZE = 1

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.813
11	0.813

*** STRATA NO. 3 GROUP NO. 2015 SAMPLE SIZE = 2

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.719
10	0.750
11	0.844

*** STRATA NO. 3 GROUP NO. 2055 SAMPLE SIZE = 6

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.313

*** STRATA NO. 3 GROUP NO. 2190 SAMPLE SIZE = 2

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.250
11	0.250
10	0.313

*** STRATA NO. 3 GROUP NO. 2330 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.241
11	0.375

*** STRATA NO. 3 GROUP NO. 2340 SAMPLE SIZE = 2

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.688
10	0.563

*** STRATA NO. 3 GROUP NO. 2345 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.188
11	0.188
10	0.375

*** STRATA NO. 4 GROUP NO. 10 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.333

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.778

*** STRATA NO. 4 GROUP NO. 20 SAMPLE SIZE = 2

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	1.000
11	1.000

*** STRATA NO. 4 GROUP NO. 235 SAMPLE SIZE = 4

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.333

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.778
11	0.778

*** STRATA NO. 4 GROUP NO. 470 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.0
11	0.0
12	0.111

*** STRATA NO. 4 GROUP NO. 455 SAMPLE SIZE = 2

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
13	0.111

*** STRATA NO. 4 GROUP NO. 820 SAMPLE SIZE = 6

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.667
11	0.667
12	0.667

*** STRATA NO. 4 GROUP NO. 845 SAMPLE SIZE = 4

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.222
11	0.333

*** STRATA NO. 4 GROUP NO. 1025 SAMPLE SIZE = 9

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.0
11	0.111

*** STRATA NO. 4 GROUP NO. 1225 SAMPLE SIZE = 2

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.889
11	0.889
12	0.889

*** STRATA NO. 4 GROUP NO. 1330 SAMPLE SIZE = 3

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.222
11	0.222

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	1.000

*** STRATA NO. 99 GROUP NO. 1554 SAMPLE SIZE = 1

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.0

*** STRATA NO. 99 GROUP NO. 2910 SAMPLE SIZE = 1

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.0
12	0.0

*** STRATA NO. 99 GROUP NO.99999 SAMPLE SIZE = 2

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	1.000
11	1.000
12	1.000

*****SIFF COST = $ 2.47

INSTITUTE FOR SOCIAL RESEARCH MONITOR SYSTEM 02/01/74

```
****LISTING OF SETUP FOLLOWS:

CARD          1         2         3         4         5         6         7         8
NO.  12345678901234567890123456789012345678901234567890123456789012345678901234567890
 1   RUN NORM
 2   TEST RUN
 3   CVAR=3 SVAR=6 DECI INFILE=INI NORM *
 4   V10-V12 *
 5   &ENDFILE
```

[illegible] OCTOBER 1974

[illegible] SERIES [illegible] INFILE=INI NORM ;

THE VARIABLE LIST IS:

V1C-V12 ;

	VAR.	TYPE	VARIABLE NAME	LOC	WIDTH	NODEC	RESP.	MDCODE1	MDCODE2	REFNO	ID	TSCOD
T	7	0	WORK GROUP NO.	10	5	0	1	0099999				00000
T	9	0	2-DIGIT CLASS	24	2	0	1	0000099				00000
T	10	0	10 GO HAS CLEAR GOALS	33	1	0	1	0000009	0000006			00000
T	11	0	11 WK ACTIVITY ORGANIZED	34	1	0	1	0000009	0000006			00000
T	12	0	12 YOU GET OTH UNIT INFO	35	1	0	1	0000009	0000006			00000

```
*** [illegible] SPECIFICATION

STRATA VARIABLE IS :     [illegible] CLASS                VARIABLE NO.    [illegible]
GROUP VARIABLE IS :      WORK GROUP NO.                VARIABLE NO.    3
MINIMUM PERCENTILE IS THE 40TH

MAXIMUM PERCENTILE IS THE 60TH
DECILE PRINT-OUT REQUESTED
PERCENTIZED NORMS MODE
NORM DATA SET
BAD DATA WILL TERMINATE RUN
EITHER MISSING DATA CODE VALUE FOR ANY VARIABLE WILL DELETE THE CASE

*** AFTER GLOBAL FILTERING
    SAMPLE SIZE =  125
    NO. OF STRATA =  5
    NO. OF GROUPS = 17

*** NO. OF CASES ELIMINATED BECAUSE OF MD1 =   0

*** NO. OF CASES ELIMINATED BECAUSE OF MD2 =   0

*** FINAL NO. OF CASES FOR ANALYSIS =  125
```

*** AGGREGATED DATA ***

STRATA	GROUP	SIZE	10	11	12
1	33110	14	3.21	2.71	2.50
1	33120	18	2.[illegible]	2.[illegible]	1.[illegible]
1	33130	14	2.57	2.27	2.00
1	33140	4	3.50	3.00	3.00
1	33150	7	2.[illegible]	2.43	[illegible]
1	33210	8	3.[illegible]	2.[illegible]5	2.62
1	33[illegible]20	13	3.46	2.77	1.54
1	[illegible]	15	3.13	2.33	2.00
2	22130	3	[illegible]7	3.67	3.00
2	33100	4	3.25	2.75	2.00
2	33200	5	2.00	2.[illegible]	2.20
2	33300	1	4.00	3.00	3.00
3	21000	5	2.20	2.40	2.40
3	22000	8	4.00	3.62	3.12
3	23000	2	2.50	3.00	3.00
4	10010	3	3.67	4.33	3.33
99	99999	1	5.00	4.00	3.00

[illegible] PRINTOUT

STRATA	VARIABLE	MINIMUM	MAXIMUM	1	2	3	4	5	6	7	8	9
1	10	2.57	3.50	2.75	2.84	2.88	3.08	3.17	3.26	3.44	3.49	3.50
1	11	2.00	3.00	2.05	2.14	2.26	2.32	2.38	2.49	2.69	2.75	2.84
1	12	1.54	3.00	1.78	1.93	2.00	2.00	2.00	2.10	2.45	2.57	2.74

*** DECILE PRINTOUT

STRATA	VARIABLE	MINIMUM	MAXIMUM	1	2	3	4	5	6	7	8	9
2	10	3.00	[illegible]	3.07	3.15	3.22	3.33	3.46	3.54	3.70	3.83	3.90
2	11	2.7[illegible]	3.[illegible]7	2.76	2.78	2.79	2.84	2.90	2.96	3.07	3.27	3.47
2	12	2.00	3.00	2.06	2.12	2.18	2.36	2.60	2.84	3.00	3.00	3.00

*** DECILE PRINTOUT

STRATA	VARIABLE	MINIMUM	MAXIMUM	1	2	3	4	5	6	7	8	9
3	10	2.50	4.00	2.64	2.78	2.92	3.06	3.20	3.36	3.52	3.68	3.84
3	11	2.40	3.42	2.52	2.64	2.76	2.88	3.00	3.12	3.25	3.37	3.50
3	12	2.80	3.12	2.84	2.88	2.92	2.96	3.00	3.02	3.05	3.07	3.10

*** DECILE PRINTOUT

STRATA	VARIABLE	MINIMUM	MAXIMUM	1	2	3	4	5	6	7	8	9
4	10	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
4	11	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33
4	12	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33

*** DECILE PRINTOUT

STRATA	VARIABLE	MINIMUM	MAXIMUM	1	2	3	4	5	6	7	8	9
69	10	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
69	11	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
69	12	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00

***. LISTING OF PERCENTIZED MATRIX

STRATA	GROUP	FREQUENCY	VARIABLE NOS.	10	11	12
1	33110	14		0.25	0.17	0.31
1	33120	13		0.13	0.0	0.36
1	33130	14		0.03	0.32	0.38
1	33140	4		0.51	0.24	0.71
1	33150	7		1.13	0.11	0.39
1	33210	9		0.59	0.06	0.36
1	33220	13		0.55	0.19	0.01
1	33230	15		0.22	0.08	0.38
2	33100	3		0.53	0.62	0.50
2	33170	4		0.15	0.08	0.38
2	33200	5		0.09	0.04	0.10
2	34200	1		0.73	0.16	0.50
3	21000	5		0.15	0.09	0.35
3	22000	3		0.70	0.65	0.58
4	23000	2		0.05	0.25	0.50
4	11010	3		0.44	1.00	0.36
99	99999	1		1.03	0.0	0.75

*** LISTING OF NORM EXTREMES BY GROUP
**** ORDERING BY PERCENTILE MAGNITUDE

*** STRATA NO. 1 GROUP NO.33110 SAMPLE SIZE = 14

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.174
10	0.248
12	0.313

*** STRATA NO. 1 GROUP NO.33120 SAMPLE SIZE = 18

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.0
12	0.043
10	0.127

*** STRATA NO. 1 GROUP NO.33130 SAMPLE SIZE = 14

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.018
10	0.03[illegible]
12	0.042

*** STRATA NO. 1 GROUP NO.33140 SAMPLE SIZE = 4

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.744

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.708

*** STRATA NO. 1 GROUP NO.33150 SAMPLE SIZE = 7

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.092
11	0.107
10	0.134

*** STRATA NO. 1 GROUP NO.33210 SAMPLE SIZE = 8

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.067
12	0.261

*** STRATA NO. 1 GROUP NO.33220 SAMPLE SIZE = 13

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.036
11	0.187

*** STRATA NO. 1 GROUP NO.33230 SAMPLE SIZE = 15

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.082
11	0.093
10	0.222

*** STRATA NO. 2 GROUP NO.33100 SAMPLE SIZE = 4

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.080
11	0.080
10	0.184

*** STRATA NC. 2 GRCUP NC.22200 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	C.CF4
10	C.CF1
12	C.C56

*** STRATA NC. 2 GRCUP NC.22300 SAMPLE SIZE = 1

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	C.7C0

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	C.7C0

*** STRATA NO. 3 GRCUP NC.21C00 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	C.C87
13	0.146
12	0.150

*** STRATA NC. 3 GRCUP NC.22010 SAMPLE SIZE = 8

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.651
13	0.7C0

*** STRATA NO. 3 GRCUP NC.22CCC SAMPLE SIZE = 2

*** LOW SCORES

1

VARIABLE NUMBER	PERCENTILE
10	0.048
11	0.255

*** STRATA NO. 4 GROUP NO.13013 SAMPLE SIZE = 3

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.259

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	1.000

*** STRATA NO. [illegible] GROUP NO.[illegible] SAMPLE SIZE = 1

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.0
12	0.250

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	1.000

******STEP COST = $ 1.14

******NO MORE RUN CARDS; TOTAL COST = $ 5.02

```
   666666666      999999999     3333333333    8888888888   2222222222      11
  666666666666   999999999999  333333333333  888888888888 222222222222    111
  66        66   99        99  33        33  88        88 22        22   1111
  66             99        99            33  88        88           22     11
  66             99        99            33  88        88           22     11
  666666666666   999999999999         3333    8888888888           22      11
  666666666666   999999999999         3333    8888888888         22        11
  66        66             99            33  88        88      22          11
  66        66             99            33  88        88    22            11
  66        66   99        99  33        33  88        88   22             11
  666666666666   999999999999  333333333333  888888888888 222222222222 1111111111
   666666666      999999999     3333333333    8888888888  222222222222 1111111111

   SSSSSSSSSS   DDDDDDDDDD    HH        HH  TTTTTTTTTTTT
  SSSSSSSSSSSS  DDDDDDDDDDD   HH        HH  TTTTTTTTTTTT
  SS        SS  DD        DD  HH        HH       TT
  SS            DD        DD  HH        HH       TT
  SSS           DD        DD  HH        HH       TT
   SSSSSSSSS    DD        DD  HHHHHHHHHHHH       TT
    SSSSSSSSS   DD        DD  HHHHHHHHHHHH       TT
          SSS   DD        DD  HH        HH       TT
           SS   DD        DD  HH        HH       TT
  SS        SS  DD        DD  HH        HH       TT
  SSSSSSSSSSSS  DDDDDDDDDDD   HH        HH       TT
   SSSSSSSSSS   DDDDDDDDDD    HH        HH       TT
```

-------693834----------------693834----------------693834----------------693834----------------693834----------------693834-------

JOB NO. 693834 UNIVERSITY OF MICHIGAN TERMINAL SYSTEM (MODEL CT124) 10:54.57 WED OCT 16/74

```
MMMMM              MMMMM   TTTTTTTTTTTTTTTTTTTTTTTTT      SSSSSSSSS
MMMMMM            MMMMMM   TTTTTTTTTTTTTTTTTTTTTTTTT    SSSSSSSSSSSSS
MMMMMMM          MMMMMMM   TTTTTTTTTTTTTTTTTTTTTTTTT   SSSSSSSSSSSSSSSSS
MMMMMMMM        MMMMMMMM           TTTTT             SSSSSS       SSSSSSS
MMMMMMMMM      MMMMMMMMM           TTTTT            SSSSS           SSSSS
MMMMMMMMMM    MMMMMMMMMM           TTTTT            SSSSS
MMMMM MMMMM  MMMMM MMMMM           TTTTT             SSSSSS
MMMMM  MMMMMMMMMM  MMMMM           TTTTT              SSSSSSSSSSSSS
MMMMM   MMMMMMMM   MMMMM           TTTTT                SSSSSSSSSSSSS
MMMMM    MMMMMM    MMMMM           TTTTT                  SSSSSSSSSSSSS
MMMMM     MMMM     MMMMM           TTTTT                          SSSSSS
MMMMM      MM      MMMMM           TTTTT                            SSSSS
MMMMM              MMMMM           TTTTT                            SSSSS
MMMMM              MMMMM           TTTTT            SSSSS           SSSSS
MMMMM              MMMMM           TTTTT            SSSSSSS       SSSSSSS
MMMMM              MMMMM           TTTTT              SSSSSSSSSSSSSSSSS
MMMMM              MMMMM           TTTTT                SSSSSSSSSSSSS
MMMMM              MMMMM           TTTTT                  SSSSSSSSS
```

```
 SSSSSSSSSS   DDDDDDDDD     HH         HH  TTTTTTTTTTTT
SSSSSSSSSSSS  DDDDDDDDDD    HH         HH  TTTTTTTTTTTT
SS        SS  DD       DD   HH         HH       TT
SS            DD        DD  HH         HH       TT
SSS           DD        DD  HH         HH       TT
 SSSSSSSSS    DD        DD  HHHHHHHHHHHHH       TT
  SSSSSSSSS   DD        DD  HHHHHHHHHHHHH       TT
        SSS   DD        DD  HH         HH       TT
         SS   DD        DD  HH         HH       TT
SS       SS   DD       DD   HH         HH       TT
SSSSSSSSSSSS  DDDDDDDDDD    HH         HH       TT
 SSSSSSSSSS   DDDDDDDDD     HH         HH       TT
```

-------693834----------------693834----------------693834----------------693834----------------693834----------------693834-------

***** 10-08-74 DUE TO HTS HARDWARE PROBLEMS, THE PROGRAMS MAP, NTILL, RFOR, AND *****
***** SCRMER WERE TEMPORARILY UNAVAILABLE. THEY SHOULD NOT ALL BE C-RAY

INSTITUTE FOR SOCIAL RESEARCH MONITOR SYSTEM 02/01/74

*****LISTING OF SETUP FOLLOWS:

```
CARD             1         2         3         4         5         6         7         8
 NO.    12345678901234567890123456789012345678901234567890123456789012345678901234567890
  1     GRUN NORM
  2     TEST RUN
  3     DVAR=7 SVAR=6   PRED STAN*
  4     V10-V16*
  5     &ENDFILE
```

PROGRAM NORM OCTOBER 1974

CVARS=3 SVARS=6 PRED STAN*

THE VARIABLE LIST IS:

V1C-V16*

	VAR.	TYPE	VARIABLE NAME	TLOC	WIDTH	NDEC	RESP.	MDCODE1	MDCODE2	REFNO	ID	TSEQNO
T	3	C	WORK GROUP NO.	11	4	0	1	0009999				00000
T	4	0	2-DIGIT CLASS	24	2	C	1	0000099				00000
T	10	C	10 CO HAS CLEAR GOALS	33	1	C	1	0000009	0000006			00000
T	11	0	11 WK ACTIVITY ORGANIZED	34	1	C	1	0000009	0000006			00000
T	12	C	12 YOU GET OTR UNIT INFO	35	1	0	1	0000009	0000006			00000
T	13	0	13 SUPS OPEN TO IDEAS	36	1	0	1	0000009	0000006			00000
T	14	0	14 TOLD ENOUGH TO DO JOB	37	1	0	1	0000009	0000006			00000
T	15	C	15 YOU FEEL LOYAL TO CO	38	1	0	1	0000009	0000006			00000
T	16	C	16 DISAGREEMTS WKED THRU	39	1	C	1	0000009	0000006			00000

```
*** PARAMETER SPECIFICATION

STRATA VARIABLE IS :      2-DIGIT CLASS                 VARIABLE NO.    6
GROUP VARIABLE IS :       WORK GROUP NO.                VARIABLE NO.    3
MINIMUM PERCENTILE IS THE 40TH

MAXIMUM PERCENTILE IS THE 60TH
PREDICTED CRITERION SCORE MODE
MASTER DATA SET
BAD DATA WILL TERMINATE RUN
EITHER MISSING DATA CODE VALUE FOR ANY VARIABLE WILL DELETE THE CASE

*** AFTER GLOBAL FILTERING
    SAMPLE SIZE =  480
    NO.OF STRATA =  5
    NO.OF GROUPS = 56

*** NO. OF CASES ELIMINATED BECAUSE OF MD1 =  11

*** NO. OF CASES ELIMINATED BECAUSE OF MD2 =   0

*** FINAL NO. OF CASES FOR ANALYSIS =  465
```

** AGGREGATED DATA ***

STRATA	GROUP	SIZE	10	11	12	13	14	15	16
0	[illegible]	5	[illegible]	[illegible]	3.40	4.40	3.80	5.00	3.80
0	355	5	3.40	3.60	2.80	3.40	3.60	4.40	3.20
0	1045	1	4.00	5.00	3.00	4.00	4.00	5.00	4.00
0	1180	2	2.50	2.00	1.50	3.50	2.50	4.50	4.00
0	1165	7	2.86	2.57	2.43	2.43	2.43	3.14	2.71
0	1220	8	4.12	3.50	2.37	3.25	4.12	4.50	3.62
0	1275	5	3.40	3.20	2.30	3.40	3.20	4.00	2.80
0	1265	8	3.37	3.75	3.50	3.25	3.37	3.75	3.75
2	75	5	3.00	3.20	2.80	3.20	3.20	3.60	3.40
2	155	4	3.50	1.75	2.00	2.25	1.75	4.00	3.00
2	174	5	4.00	3.60	3.60	4.40	4.20	4.80	4.00
2	250	7	4.00	3.43	2.71	3.86	3.86	4.43	3.57
2	285	3	4.33	4.00	4.00	3.67	3.67	4.67	4.33
2	345	3	3.33	3.00	2.67	2.67	3.00	3.33	3.67
2	370	4	3.75	3.75	2.50	3.50	3.50	4.50	3.50
2	410	6	3.33	3.33	2.67	2.83	2.83	4.00	3.33
2	435	1	4.00	3.00	2.00	3.00	2.00	4.00	4.00
2	530	11	3.18	3.18	3.18	2.64	3.36	3.45	3.36
2	565	7	3.86	3.57	3.00	3.43	3.57	4.43	3.57
2	655	19	3.79	3.47	3.42	3.53	3.37	4.32	3.58
2	730	10	2.90	3.00	2.70	2.50	2.90	3.80	2.90
2	850	7	3.14	3.29	3.14	3.57	3.57	3.57	3.43
2	870	3	2.33	2.33	3.00	1.67	2.00	2.33	2.67
2	1100	8	3.00	3.25	3.37	2.75	3.50	3.00	2.75
2	1170	12	3.50	3.00	2.17	1.92	2.58	3.42	3.08
2	1250	3	4.33	4.00	3.00	3.00	2.67	4.00	3.33
2	1260	6	2.83	2.83	2.50	3.33	3.50	4.17	3.33
2	1280	7	2.43	3.71	2.43	3.00	3.00	4.43	3.71
2	1300	17	3.06	3.00	2.29	2.65	2.76	3.71	3.00
2	1360	6	3.33	3.67	3.83	3.33	3.50	4.00	3.67
2	1403	5	4.00	4.00	4.00	3.60	4.00	4.40	3.40
2	1455	6	3.83	3.83	3.50	3.17	3.67	4.00	4.00
2	1500	3	3.33	3.00	2.67	2.67	3.33	3.67	4.00
2	1560	3	4.33	4.33	3.67	4.67	4.33	5.00	4.33
2	1600	9	4.00	3.78	3.78	4.00	4.11	4.44	3.44
2	1640	1	3.00	3.00	1.00	2.00	2.00	3.00	3.00
2	1660	2	3.50	4.50	4.00	4.00	4.00	4.00	4.50
2	1655	2	4.00	4.00	3.50	4.50	4.00	5.00	4.50
2	1775	5	3.00	3.40	3.00	3.40	2.60	4.40	4.00
2	1911	7	3.43	2.86	2.57	2.43	2.71	3.86	3.57
2	1961	6	3.50	3.50	3.00	3.17	3.67	4.33	3.00
2	1900	4	4.50	4.00	2.75	3.50	3.50	5.00	4.50
2	1970	6	4.17	3.83	3.50	4.00	4.17	4.67	4.50
2	2025	6	3.83	3.67	3.00	3.33	3.50	4.00	3.67
2	2055	6	3.33	3.33	3.50	3.67	3.67	3.67	3.67
2	2130	2	4.50	4.00	3.00	4.50	4.50	5.00	4.50
2	2165	5	3.60	3.20	2.40	2.60	2.60	3.60	3.80
2	2205	6	3.17	3.17	3.33	3.33	3.50	3.67	3.17
2	2240	2	4.00	4.00	4.00	5.00	4.50	5.00	3.50
2	2271	6	4.17	3.83	3.17	3.17	3.67	4.67	4.00
2	2405	4	3.25	2.75	2.25	3.00	2.75	3.00	4.25
3	25	5	3.40	3.00	2.80	3.20	2.80	4.60	3.40
3	90	4	2.50	1.50	2.00	2.25	1.75	2.00	3.00
3	140	2	4.00	4.00	3.50	4.00	2.50	4.50	3.50
3	240	4	3.50	3.50	3.00	3.50	3.75	4.00	3.75

*** AGGREGATED DATA ***

STRATA	GROUP	SIZE	10	11	12	13	14	15	16
[illegible]	475	5	3.80	2.50	2.00	3.00	3.00	2.40	2.80
[illegible]	[illegible]	5	3.00	2.40	1.20	2.40	2.60	3.20	3.00
[illegible]	500	5	3.20	2.40	2.60	3.20	3.00	4.00	2.20
[illegible]	575	2	2.00	2.00	3.00	3.00	3.00	4.00	3.50
[illegible]	655	1	5.00	[illegible]	4.00	4.00	4.00	5.00	2.00
[illegible]	900	[illegible]	4.00	3.17	2.17	2.83	3.33	3.50	3.17
3	965	9	3.22	3.72	2.11	3.22	3.00	4.11	3.44
3	1030	6	3.57	3.17	3.67	4.00	4.17	4.33	4.33
3	1090	5	3.40	3.40	2.40	3.20	3.00	4.40	3.20
3	1095	1	3.00	1.00	1.00	2.00	1.00	4.00	2.00
3	1210	3	3.67	4.33	2.33	3.67	4.33	5.00	3.33
3	1235	5	4.00	4.40	2.60	3.80	3.90	4.20	3.60
3	1240	10	3.60	3.00	2.50	3.10	3.10	4.00	3.60
3	1245	8	3.37	3.50	2.37	2.87	3.12	4.00	3.37
3	1335	7	4.1[illegible]	3.86	4.14	3.86	4.14	5.00	3.57
3	1345	1	4.00	4.00	3.00	3.00	4.00	5.00	3.00
3	1350	3	3.67	3.67	4.33	3.67	4.33	5.00	4.33
3	1445	3	4.33	4.00	3.33	4.00	4.33	4.67	3.33
3	1555	4	4.25	3.50	3.75	3.75	4.25	4.25	3.50
3	1770	5	4.20	3.60	4.00	3.60	4.00	4.90	3.60
3	1955	2	4.00	3.50	3.00	3.50	3.50	4.50	3.50
3	1940	1	4.00	4.00	3.00	5.00	5.00	5.00	5.00
3	2015	2	4.00	4.00	3.50	4.00	4.00	5.00	3.50
3	2065	[illegible]	3.93	3.50	2.67	3.50	3.23	4.17	4.00
3	2130	2	3.50	3.00	2.50	3.00	2.50	4.00	2.50
3	2330	5	3.40	3.20	3.00	3.40	3.20	3.80	3.70
3	2340	1	5.00	4.00	4.00	5.00	4.00	4.00	5.00
3	2345	5	3.60	2.40	2.40	2.80	3.20	3.40	3.00
4	10	5	3.60	3.60	4.00	3.80	3.80	4.60	4.20
4	20	1	4.00	4.00	4.00	4.00	4.00	5.00	4.00
4	235	4	4.00	4.00	3.50	4.00	3.00	4.50	4.00
4	470	5	2.90	3.00	3.00	2.80	3.20	3.40	3.20
4	455	2	3.00	3.50	3.50	3.00	3.50	4.50	3.50
4	520	6	4.00	4.00	3.67	4.17	4.33	4.50	4.00
4	835	4	3.75	3.50	3.25	3.75	3.50	3.75	4.00
4	1025	3	3.47	3.22	2.22	2.93	3.22	3.89	3.00
4	1275	2	4.00	[illegible]	4.00	5.00	4.00	5.00	4.50
4	1330	3	3.33	3.33	4.33	4.00	3.67	4.67	3.67
99	1554	1	4.00	4.00	4.00	4.00	4.00	5.00	3.00
99	2010	1	3.00	4.00	2.00	3.00	3.00	3.00	3.00
99	99999	2	4.50	4.00	4.00	3.50	3.50	4.50	4.50

*** LISTING OF STANDARDIZED MATRIX

STRATA	GROUP	FREQUENCY	VARIABLE NOS. 10	11	12	13	14	15	16
0	350	5	1.01	0.83	1.13	1.75	0.70	1.21	0.65
0	355	5	-0.11	0.14	0.12	-0.10	0.37	0.19	-0.59
0	1045	1	1.01	1.77	0.46	1.01	1.04	1.21	1.06
0	1190	[illegible]	-1.73	-1.70	-2.05	0.09	-1.47	0.36	1.06
0	1185	7	-1.11	-1.05	-0.50	-1.90	-1.58	-1.33	-1.60
0	1200	3	1.24	0.03	-0.53	-0.39	1.24	[illegible]	0.23
0	1275	5	-0.11	-0.32	0.12	-0.10	-0.20	-0.46	-1.42
0	1295	3	-0.15	0.31	1.30	-0.38	-0.01	-0.91	0.55
2	75	5	-0.06	-0.47	-0.29	-0.09	-0.19	-0.76	-0.48
2	155	4	-0.27	-3.06	-1.52	-1.35	-2.32	-0.10	-1.27
2	176	5	0.73	0.61	0.36	1.52	1.28	1.21	0.72
2	250	7	0.78	-0.06	-0.41	0.73	0.78	0.60	-0.13
2	285	3	1.47	0.97	1.58	0.54	0.56	0.99	1.38
2	345	3	-0.61	-0.83	-0.48	-0.80	-0.48	-1.20	0.65
2	370	4	0.25	0.52	-0.74	0.31	0.25	0.72	-0.28
2	410	5	-0.61	-0.23	-0.48	-0.56	-0.73	-0.10	-0.61
2	435	1	0.73	-0.93	-1.52	-0.35	-1.95	-0.10	0.72
2	530	11	-0.95	-0.50	0.32	-0.84	0.05	-1.00	-0.55
2	605	7	0.44	0.20	0.33	0.72	0.36	0.60	-0.13
2	645	14	0.34	-0.07	0.59	0.35	0.06	0.41	-0.12
2	700	10	-1.57	-0.73	-1.21	-1.02	-0.63	-0.43	-1.47
2	850	7	-1.01	-0.52	0.25	0.41	0.36	-0.81	-0.42
2	970	3	-2.70	-2.03	0.03	-2.13	-1.95	-2.85	-1.93
2	1100	8	-1.31	-0.39	0.62	-1.45	0.25	-1.75	-1.77
2	1170	12	-0.27	-0.93	-1.26	-1.80	-1.09	-0.38	-1.10
2	1250	3	1.47	0.37	0.03	-0.35	-0.97	-0.10	-0.61
2	1260	6	0.43	0.77	-0.74	0.76	0.25	0.17	-0.61
2	1310	7	-0.42	0.46	-0.95	-0.35	-0.48	0.60	0.15
2	1300	17	-1.13	-0.83	-1.06	-0.82	-0.83	-0.59	-1.27
2	1360	6	-0.61	0.37	1.33	0.09	0.25	-0.10	0.05
2	1403	5	0.74	0.97	1.58	0.45	0.99	0.55	-0.48
2	1455	5	0.43	-0.23	0.01	-0.13	0.50	-0.10	0.72
2	1500	3	-0.61	-0.63	-0.48	-0.80	0.01	-0.65	0.72
2	1560	3	1.47	1.57	1.07	1.87	1.48	1.54	1.38
2	1600	3	0.78	0.57	1.34	0.98	1.15	0.63	-0.39
2	1640	1	-1.31	-0.83	-4.07	-1.69	-1.95	-1.75	-1.27
2	1660	2	-0.27	1.57	1.58	0.98	0.99	-0.10	1.71
2	1695	3	0.78	0.97	0.11	1.65	0.99	1.54	1.71
2	1775	5	-1.31	-0.11	0.33	0.15	-1.07	0.59	0.72
2	1811	7	-1.42	-1.09	-0.43	-1.17	-0.90	-0.34	-0.13
2	1941	[illegible]	-0.77	0.07	0.03	-0.13	0.50	0.44	-1.27
2	1900	4	1.82	0.47	-0.35	0.31	0.25	1.54	1.71
2	1970	5	1.13	0.67	0.81	0.38	1.23	0.99	1.71
2	2025	6	0.43	0.07	0.03	0.09	0.25	-0.10	0.05
2	2096	6	-0.61	-0.23	0.81	0.54	0.50	-0.55	0.05
2	2130	2	1.82	1.87	0.03	1.65	1.72	1.54	1.71
2	2166	5	-0.04	-0.47	-0.90	-0.89	-1.07	-0.76	0.32
2	2205	6	-0.96	-0.53	0.55	0.09	0.25	-0.65	-0.94
2	2240	2	0.74	1.87	1.58	2.32	1.72	1.54	-0.28
2	2231	5	1.13	0.67	0.23	-0.13	0.50	0.99	0.72
2	2405	4	-0.79	-1.29	-1.13	-0.35	-0.85	-1.75	1.21
3	25	5	-0.55	-0.41	-0.23	-0.33	-0.81	0.59	0.03
3	30	4	-2.09	-2.30	-1.25	-1.78	-2.12	-3.40	-0.56
3	140	2	0.48	0.65	0.67	0.89	0.06	0.44	0.17
4	240	3	-0.33	0.72	0.03	0.13	0.37	-0.33	0.54

*** LISTING OF STANDARDIZED MATRIX

STRATA	GROUP	FREQUENCY	VARIABLE NOS.	10	11	12	13	14	15	16
3	475	5		0.14	-0.66	-1.25	-0.64	-0.56	-1.25	-0.86
3	480	5		0.14	-0.91	-2.27	-1.55	-1.31	-1.56	-0.56
3	500	5		-0.69	-0.41	-0.48	-0.33	-0.56	-0.33	-1.74
3	525	2		-2.94	-1.67	0.03	-0.64	-0.56	-0.33	0.17
3	595	1		2.19	2.11	1.90	0.89	0.68	1.21	-2.03
3	500	6		0.49	-0.20	-1.03	-0.89	-0.15	-1.10	-0.32
3	565	9		-0.85	-0.13	0.17	-0.30	-0.56	-0.16	0.05
3	1070	6		-0.09	-0.20	0.88	0.89	0.89	0.18	1.40
3	1050	5		-0.55	0.09	-0.23	-0.33	0.18	0.29	-0.27
3	1095	1		-1.23	-2.93	-2.52	-2.16	-3.05	-0.33	-2.03
3	1210	3		-0.05	1.27	0.45	0.38	1.10	1.21	-0.07
3	1225	5		0.49	0.65	0.79	0.59	0.43	-0.02	0.37
3	1240	10		-0.21	-0.41	-0.51	-0.48	-0.44	-0.33	0.32
3	1245	8		-0.59	0.22	-0.77	-0.33	-0.41	-0.33	-0.01
3	1335	7		0.72	0.57	1.49	0.67	0.86	1.21	0.28
3	1345	1		0.44	0.65	0.03	-0.64	0.68	1.21	-0.56
3	1350	3		-0.03	0.43	1.73	0.38	1.10	1.21	1.40
3	1445	3		1.05	0.85	0.45	0.99	1.10	0.70	-0.07
3	1635	4		0.90	0.22	[illegible]	0.51	0.95	0.06	0.17
3	1770	5		0.82	0.35	1.30	0.28	0.68	0.90	0.32
3	1855	2		0.48	0.22	0.03	0.13	0.06	0.44	0.17
3	1960	1		0.48	0.85	0.07	2.42	1.93	1.21	2.37
3	2015	2		0.49	0.65	0.57	0.99	0.68	1.21	0.17
3	2085	6		0.19	0.22	-1.40	0.13	-0.15	-0.07	0.91
3	2150	2		-0.38	-0.91	-0.61	-0.64	-1.19	-0.33	-1.30
3	2330	5		-0.55	-0.16	0.03	-0.02	-0.31	-0.64	-0.27
3	2340	1		2.19	0.85	1.30	2.42	0.68	-0.33	2.27
3	2345	5		-0.21	-0.66	-0.74	-0.94	-0.31	-1.25	-0.56
4	10	5		-0.04	-0.04	0.78	0.09	0.45	0.44	0.90
4	20	1		0.92	1.10	0.78	0.40	0.95	1.23	0.44
4	235	4		0.92	1.10	-0.09	0.40	-1.57	0.24	0.44
4	470	5		-1.96	-1.75	-0.94	-1.46	-1.06	-1.95	-1.39
4	495	2		-1.44	[illegible]	-0.98	-1.15	-0.31	0.24	-0.70
4	520	6		0.32	1.10	0.20	0.66	1.79	0.24	0.44
4	965	4		0.32	[illegible]	-0.51	0.01	-0.31	-1.75	0.44
4	1025	3		0.12	-1.12	-2.27	-1.32	-1.01	-0.58	-1.84
4	1225	2		0.92	1.10	0.78	1.96	0.95	1.23	1.58
4	1330	3		-0.64	-0.80	1.15	0.40	0.11	0.57	-0.32
50	1554	1		0.27	0.0	0.71	1.22	1.22	0.58	-0.71
50	2910	1		-1.34	0.0	-1.41	-1.22	-1.72	-1.37	-0.71
50	99999	2		1.07	0.0	0.71	0.0	0.0	0.39	1.41

*** LISTING OF PRED. CRIT. SCORES

STRATA	GROUP	FREQUENCY	VARIABLE NOS.	10	11	12	13	14	15	16
0	350	5		0.26	0.29	0.02	1.14	0.27	0.86	0.65
0	355	5		-0.03	0.05	0.00	-0.06	0.14	0.14	-0.59
0	1045	1		0.26	0.62	0.01	0.66	0.40	0.86	1.06
0	1170	2		-0.47	-0.43	-0.03	0.06	-0.57	0.26	1.06
0	1165	7		-0.29	-0.37	-0.01	-1.24	-0.61	-1.38	-1.60
0	1200	8		0.33	0.01	-0.01	-0.25	0.48	0.26	0.25
0	1275	5		-0.03	-0.11	0.00	-0.06	-0.12	-0.35	-1.42
0	1285	4		-0.04	0.11	0.02	-0.25	-0.00	-0.65	0.55
2	75	5		-0.04	-0.26	-0.09	-0.05	-0.09	-0.44	-0.48
2	158	4		-0.27	-1.71	-0.52	-0.83	-1.06	-0.06	-1.27
2	176	5		0.49	0.24	0.33	0.93	0.60	0.69	0.72
2	250	7		0.49	-0.03	-0.14	0.48	0.36	0.34	-0.13
2	265	3		0.91	0.54	0.54	0.33	0.23	0.57	1.38
2	345	3		-0.38	-0.46	-0.17	-0.49	-0.22	-0.69	0.05
2	370	4		0.16	0.25	-0.25	0.19	0.12	0.41	-0.28
2	410	5		-0.38	-0.13	-0.17	-0.35	-0.34	-0.06	-0.61
2	435	1		0.48	-0.46	-0.52	-0.22	-0.91	-0.36	0.72
2	550	11		-0.52	-0.24	0.11	-0.51	0.02	-0.57	-0.55
2	605	7		0.30	0.11	0.01	0.13	0.17	0.34	-0.13
2	765	15		0.21	-0.04	0.24	0.21	0.03	0.24	-0.12
2	730	10		-0.94	-0.46	-0.41	-0.63	-0.29	-0.25	-1.47
2	850	7		-0.63	-0.19	0.09	0.25	0.17	-0.46	-0.42
2	970	3		-1.69	-1.13	0.01	-1.31	-0.91	-1.63	-1.93
2	1150	4		-0.81	-0.21	0.21	-0.33	0.12	-1.00	-1.77
2	1170	12		-0.17	-0.44	-0.43	-1.10	-0.51	-0.72	-1.10
2	1250	3		0.91	0.54	0.01	-0.22	-0.45	-0.06	-0.61
2	1260	6		0.27	0.37	-0.25	0.47	0.12	0.10	-0.61
2	1280	7		-0.26	0.25	-0.29	-0.22	-0.22	0.24	0.15
2	1300	17		-0.74	-0.44	-0.36	-0.51	-0.38	-0.54	-1.27
2	1360	6		-0.38	0.21	0.45	0.06	0.12	-0.06	0.05
2	1403	5		0.48	0.54	0.54	0.27	0.46	0.32	-0.49
2	1455	6		0.27	-0.13	0.28	-0.08	0.23	-0.06	0.72
2	1500	3		-0.38	-0.46	-0.17	-0.49	0.00	-0.37	0.72
2	1560	3		0.91	0.97	0.37	1.15	0.69	0.68	1.38
2	1600	3		0.49	0.32	0.42	0.60	0.54	0.36	-0.39
2	1640	1		-0.81	-0.46	-1.05	-1.03	-0.91	-1.00	-1.37
2	1660	2		-0.17	1.04	0.54	0.60	0.46	-0.06	1.71
2	1665	2		0.49	0.54	0.29	1.01	0.46	0.68	1.71
2	1775	5		-0.81	-0.06	0.01	0.11	-0.50	0.32	0.72
2	1811	7		-0.26	-0.60	-0.22	-0.68	-0.42	-0.19	-0.13
2	1871	6		-0.17	0.04	0.01	-0.08	0.73	0.25	-1.27
2	1900	4		1.13	0.54	-0.12	0.13	0.12	0.48	1.71
2	1970	6		0.70	0.37	0.28	0.60	0.57	0.57	1.71
2	2025	6		0.27	0.04	0.01	0.06	0.12	-0.06	0.05
2	2050	6		-0.38	-0.13	0.28	0.33	0.23	-0.37	0.05
2	2130	2		1.13	1.04	0.01	1.01	0.90	0.88	1.71
2	2160	5		-0.04	-0.26	-0.31	-0.54	-0.50	-0.44	0.32
2	2205	5		-0.60	-0.24	0.19	0.06	0.12	-0.37	-0.54
2	2240	2		0.48	1.04	0.54	1.42	0.80	0.66	-0.28
2	2291	5		0.73	0.27	0.10	-0.09	0.73	0.57	0.72
2	2405	4		-0.49	-0.71	-0.39	-0.22	-0.39	-1.00	1.21
3	25	5		-0.13	-0.14	-0.11	-0.22	-0.48	0.15	0.03
3	30	4		-0.44	-0.90	-0.61	-1.20	-1.26	-0.85	-0.56
3	140	2		0.11	0.30	0.32	0.60	0.04	0.11	0.17
3	240	4		-0.07	0.08	0.01	0.09	0.22	-0.08	0.54

*** LISTING OF PRED. CRIT. SCORES

STRATA	GROUP	FREQUENCY	VARIABLE NOS. 10	11	12	13	14	15	16
3	475	5	0.03	[illegible]	-0.01	-0.43	-0.34	-0.21	-0.86
3	490	5	0.33	-0.32	-1.11	-1.05	-0.78	-0.39	-0.56
3	500	5	-0.21	-0.22	-0.23	-0.27	-0.34	-0.08	-1.74
3	525	7	-0.64	-0.58	0.01	-0.43	-0.34	-0.08	0.17
3	565	1	0.50	0.74	0.64	0.40	0.41	0.30	-2.03
3	[illegible]	6	0.11	-0.07	-0.50	-0.60	-0.09	-0.27	-0.72
3	565	9	-0.20	-0.05	[illegible]	-0.70	-0.34	-0.04	0.09
3	1030	6	-0.02	-0.07	0.43	0.60	0.53	0.05	1.40
3	[illegible]	5	-0.13	0.03	-0.11	-0.22	0.11	0.07	-0.27
3	[illegible]	1	-0.29	-1.02	-1.23	-1.46	-1.87	-0.08	-2.03
3	1210	3	-0.02	0.44	0.27	0.26	0.65	0.30	-0.07
3	1235	5	0.11	0.30	0.39	0.40	0.26	-0.01	0.32
3	1240	10	-0.05	-0.14	-0.30	-0.33	-0.26	-0.06	0.32
3	1245	[illegible]	-0.14	0.08	-0.37	-0.56	-0.24	-0.08	-0.01
3	[illegible]	7	0.17	0.23	0.72	0.45	0.51	0.20	0.28
3	1345	1	0.21	0.20	0.01	-0.43	0.42	0.30	-0.56
3	[illegible]	3	-0.02	0.15	0.44	0.26	0.65	0.30	1.40
3	1445	3	0.24	0.30	0.22	0.60	0.05	0.17	-0.07
3	[illegible]	4	0.21	0.08	0.49	0.34	0.59	0.01	0.17
3	[illegible]	5	0.17	0.12	0.64	0.19	0.41	0.23	0.22
3	[illegible]	2	0.11	0.08	0.01	0.09	0.04	0.11	0.17
3	1960	1	0.11	0.30	0.01	1.63	1.15	0.30	2.37
3	2015	[illegible]	0.11	0.31	0.32	0.40	0.41	0.40	0.17
3	[illegible]	6	0.04	[illegible]	-0.19	[illegible]	-0.09	-0.02	0.51
3	[illegible]	2	-0.05	-0.14	-0.30	-0.43	-0.71	-0.08	-1.30
3	[illegible]	5	-0.13	-0.06	0.01	-0.02	-0.19	-0.16	-0.27
3	2340	1	0.50	0.30	0.64	1.63	0.41	-0.08	2.37
3	2345	5	-0.05	-0.23	-0.36	-0.63	-0.19	-0.31	-0.56
4	10	5	-0.02	-0.04	0.56	0.08	0.26	0.29	0.50
4	20	1	0.60	0.67	0.56	0.36	0.55	0.82	0.44
4	235	4	0.40	0.87	-0.06	0.36	-0.91	0.16	0.44
4	470	5	-1.23	-1.40	-0.68	-1.21	-0.62	-1.30	-1.39
4	495	2	-0.90	-0.26	-0.06	-1.04	-0.18	0.16	-0.70
4	570	6	0.60	0.87	0.15	0.60	1.04	0.16	0.44
4	855	4	0.21	-0.26	-0.37	0.01	-0.18	-0.84	0.44
4	1025	9	0.08	-0.85	-1.64	-1.19	-0.58	-0.65	-1.84
4	1225	2	0.60	0.87	0.56	1.76	0.55	0.82	1.58
4	1330	3	-0.44	-0.64	0.97	0.36	0.06	0.38	-0.32
99	1554	1	0.20	0.0	0.35	0.0	0.0	0.27	-0.71
99	2710	1	-1.01	0.0	-0.71	0.0	0.0	-0.38	-0.71
99	99999	2	0.91	0.0	0.35	0.0	0.0	0.11	1.41

*** LISTING OF PERCENTIZED MATRIX

STRATA	GROUP	FREQUENCY	VARIABLE NOS.	10	11	12	13	14	15
0	350	5		0.20	0.60	0.0	1.00	0.40	0.90
0	355	5		0.20	0.60	0.40	0.0	1.00	0.80
0	1045	1		0.20	0.60	0.0	0.40	0.40	1.00
0	1180	2		0.40	0.0	0.60	0.80	0.20	1.00
0	1185	7		0.80	0.60	1.00	0.20	0.40	0.0
0	1200	8		0.80	0.40	0.20	0.0	1.00	0.60
0	1275	5		0.80	0.40	1.00	0.60	0.20	0.0
0	1285	8		0.40	1.00	0.40	0.20	0.60	0.0
2	75	5		1.00	0.20	0.40	0.40	0.60	0.0
2	144	4		0.80	0.0	0.60	0.40	0.20	1.00
2	178	5		0.40	0.20	0.0	1.00	0.60	0.80
2	250	7		0.80	0.20	0.0	1.00	0.40	0.40
2	285	3		1.00	0.40	0.60	0.20	0.0	0.80
2	345	3		0.60	0.40	1.00	0.20	0.80	0.0
2	370	4		0.40	0.50	0.0	0.60	0.20	1.00
2	410	5		0.0	0.80	0.60	[illegible]	0.40	1.00
2	435	1		1.00	0.40	0.20	0.60	0.0	0.80
2	530	11		0.0	0.60	1.00	0.40	0.80	0.20
2	605	7		0.80	0.20	0.0	0.40	0.60	1.00
2	745	10		0.40	0.0	0.30	0.60	0.70	1.00
2	790	10		0.0	0.40	0.60	0.20	0.80	1.00
2	850	7		0.0	0.40	0.60	1.00	0.80	0.20
2	970	3		0.0	0.60	1.00	0.40	0.80	0.20
2	[illegible]	3		0.40	0.60	1.00	0.20	0.80	0.0
2	1170	12		1.00	0.40	[illegible]	0.0	0.20	0.80
2	1250	3		1.00	0.90	0.60	0.20	0.0	0.40
2	1260	6		0.60	0.80	0.0	1.00	0.40	0.20
2	1280	7		0.20	0.80	0.0	0.40	0.40	1.00
2	1300	17		0.0	0.40	0.80	0.70	0.60	1.00
2	1380	6		0.0	0.80	1.00	0.40	0.60	0.20
2	1433	5		0.60	0.80	1.00	0.0	0.40	0.70
2	1455	6		0.80	0.0	1.00	0.20	0.60	0.40
2	1500	3		0.40	0.20	0.30	0.0	1.00	0.60
2	1550	3		0.90	0.40	0.0	1.00	0.70	0.60
2	1600	3		0.60	0.0	0.40	1.00	0.80	0.20
2	1640	1		0.80	1.00	0.0	0.20	0.60	0.40
2	1660	2		0.0	1.00	0.60	0.80	0.40	0.20
2	[illegible]	2		0.40	0.60	0.0	1.00	0.20	0.90
2	1775	5		0.0	0.40	0.60	0.80	0.20	1.00
2	1811	7		0.60	0.20	0.80	0.0	0.40	1.00
2	1861	6		0.0	0.60	0.40	0.70	0.80	1.00
2	[illegible]	4		1.00	0.60	0.0	0.40	0.20	0.90
2	1970	6		1.00	0.20	0.0	0.80	0.60	0.40
2	2025	6		1.00	0.40	0.20	0.40	0.60	0.0
2	2056	6		0.0	0.40	0.80	1.00	0.60	0.20
2	2130	2		1.00	0.60	0.0	0.60	0.20	0.40
2	2166	5		1.00	0.80	0.60	0.0	0.20	0.40
2	2215	5		0.0	0.40	1.00	0.60	0.80	0.20
2	2240	2		0.0	0.80	0.20	1.00	0.40	0.60
2	2792	6		1.00	0.40	0.20	0.0	0.40	0.80
2	2405	4		0.40	0.20	0.30	1.00	0.60	0.0
3	25	5		0.60	0.40	0.80	0.20	0.0	1.00
3	30	4		1.00	0.60	0.90	0.20	0.0	0.40
3	140	2		0.40	0.60	0.80	1.00	0.0	0.20
3	240	4		0.0	0.60	0.40	0.90	1.00	0.20

*** LISTING OF PERCENTIZED MATRIX

STRATA	GROUP	FREQUENCY	VARIABLE NOS.	10	11	12	13	14	15
3	475	5		1.00	[illegible]	0.0	0.20	0.40	0.60
3	480	5		1.00	0.90	0.0	0.20	0.40	0.80
3	500	5		0.80	0.20	0.40	0.60	0.0	1.00
3	525	7		0.0	0.20	1.00	0.40	0.60	0.90
3	555	1		0.40	1.00	0.80	0.60	0.20	0.0
3	600	6		1.00	0.90	0.20	0.0	0.60	0.40
3	645	9		0.40	0.60	1.00	0.20	0.0	0.90
3	1020	6		0.20	0.0	0.60	1.00	0.80	0.40
3	1070	5		0.20	0.60	0.40	0.0	1.00	0.80
3	1095	1		0.60	0.60	0.40	0.20	0.0	1.00
3	1210	3		0.0	0.80	0.20	0.40	1.00	0.60
3	1235	5		0.20	0.60	0.80	1.00	0.40	0.0
3	1240	10		1.00	0.60	0.20	0.0	0.40	0.80
3	1245	8		0.60	1.00	0.20	0.0	0.40	0.90
3	1355	7		0.0	0.20	1.00	0.60	0.80	0.40
3	1345	1		0.40	0.60	0.20	0.0	1.00	0.90
3	1350	2		0.0	0.70	1.00	0.40	0.80	0.60
3	1445	3		0.40	0.60	0.70	0.80	1.00	0.0
3	1555	4		0.40	0.20	0.30	0.60	1.00	0.0
3	1770	5		0.40	0.0	1.00	0.20	0.80	0.60
3	1855	2		1.00	0.40	0.0	0.60	0.20	0.90
3	1960	1		0.20	0.40	0.0	1.00	0.80	0.60
3	2015	2		0.0	0.20	0.50	1.00	0.80	0.40
3	2085	6		0.60	0.80	0.0	1.00	0.20	0.40
3	2100	2		0.80	0.60	0.40	0.20	0.0	1.00
3	2330	5		0.40	0.50	1.00	0.80	0.0	0.20
3	2340	1		0.60	0.20	0.90	1.00	0.40	0.0
3	2345	5		1.00	0.40	0.20	0.0	0.80	0.40
4	10	5		0.20	0.0	1.00	0.40	0.60	0.80
4	20	1		0.60	1.00	0.40	0.0	0.20	0.80
4	335	4		0.80	1.00	0.20	0.60	0.0	0.40
4	470	5		0.60	0.0	0.30	0.70	1.00	0.40
4	495	2		0.20	0.40	0.80	0.0	0.60	1.00
4	570	4		0.60	0.80	0.0	0.40	1.00	0.20
4	855	4		1.00	0.40	0.70	0.90	0.60	0.0
4	1025	9		1.00	0.40	0.0	0.20	0.80	0.60
4	1275	2		0.40	0.80	0.20	1.00	0.0	0.60
4	1370	3		0.20	0.0	1.00	0.60	0.40	0.90
69	1554	1		0.60	0.20	1.00	0.40	0.0	0.80
69	2910	1		0.0	1.00	0.20	0.60	0.80	0.40
69	[illegible]	2		1.00	0.20	0.80	0.40	0.0	0.60

*** LISTING OF NORM EXTREMES BY GROUP
RANK ORDERING BY PERCENTILE MAGNITUDE

*** STRATA NO. 0 GROUP NO. 930 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.0
13	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
15	0.800
13	1.000

*** STRATA NO. 0 GROUP NO. 955 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
13	0.0
10	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
15	0.800
14	1.000

*** STRATA NO. 0 GROUP NO. 1045 SAMPLE SIZE = 1

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.0
13	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.800
15	1.000

*** STRATA NO. [illegible]   GROUP NO. 11[illegible]0   SAMPLE SIZE = [illegible]

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.0
14	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
13	0.P00
15	1.000

*** STRATA NO. 0   GROUP NO. 1195   SAMPLE SIZE = 7

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
15	0.0
13	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.P00
12	1.000

*** STRATA NO. 0   GROUP NO. 1200   SAMPLE SIZE = P

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
13	0.0
12	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.P00
14	1.000

*** STRATA NO. 0   GROUP NO. 1275   SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE

15	0.0
14	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
13	0.800
12	1.000

*** STRATA NO. 3 GROUP NO. 1285 SAMPLE SIZE = 8

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
15	0.0
13	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.800
11	1.000

*** STRATA NO. 2 GROUP NO. 75 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
15	0.0
11	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
13	0.800
13	1.000

*** STRATA NO. 2 GROUP NO. 155 SAMPLE SIZE = 4

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.0
14	0.250

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE

10	C.PCC
15	1.CCC

*** STRATA NO. 2   GROUP NO. 172   SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.0
11	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
15	C.8CC
13	1.C00

*** STRATA NO. 2   GROUP NO. 250   SAMPLE SIZE = 7

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.C
11	C.2C0

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	C.8CC
13	1.UCC

*** STRATA NO. 2   GROUP NO. 285   SAMPLE SIZE = 3

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
14	0.C
13	C.2CC

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
15	0.800
10	1.CCC

*** STRATA NO. 2   GROUP NO. 34[illegible]   SAMPLE SIZE = 3

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
15	0.0
13	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
14	0.800
12	1.000

*** STRATA NO. 2   GROUP NO. 370   SAMPLE SIZE = 4

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.0
14	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.800
15	1.000

*** STRATA NO. 2   GROUP NO. 410   SAMPLE SIZE = 6

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.0
13	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.800
15	1.000

*** STRATA NO. 3   GROUP NO. 43[illegible]   SAMPLE SIZE = 1

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE

VARIABLE NUMBER	PERCENTILE
14	0.0
12	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
15	0.800
10	1.000

*** STRATA NO. 2 GROUP NO. 530 SAMPLE SIZE = 11

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.0
15	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
14	0.800
12	1.000

*** STRATA NO. 2 GROUP NO. 605 SAMPLE SIZE = 7

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.0
11	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
13	0.800
15	1.000

*** STRATA NO. 2 GROUP NO. 655 SAMPLE SIZE = 10

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.0
14	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE

12	0.800
15	1.000

*** STRATA NO. 2 GROUP NO. 750 SAMPLE SIZE = 10

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.0
13	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
14	0.800
15	1.000

*** STRATA NO. 2 GROUP NO. 850 SAMPLE SIZE = 7

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.0
15	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
14	0.800
13	1.000

*** STRATA NO. 2 GROUP NO. 870 SAMPLE SIZE = 3

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
13	0.0
15	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
14	0.800
12	1.000

*** STRATA NO. 2 GROUP NO. 11[illegible] SAMPLE SIZE = 8

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
15	0.0
13	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
14	0.800
12	1.000

*** STRATA NO. 2 GROUP NO. 1170 SAMPLE SIZE = 12

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
13	0.0
14	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
15	0.800
10	1.000

*** STRATA NO. 2 GROUP NO. 1250 SAMPLE SIZE = 3

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
14	0.0
13	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.800
10	1.000

*** STRATA NO. 2 GROUP NO. 1260 SAMPLE SIZE = 6

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE

12	0.0
15	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.800
13	1.000

*** STRATA NO. 2 GROUP NO. 1280 SAMPLE SIZE = 7

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.0
10	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.800
15	1.000

*** STRATA NO. 2 GROUP NO. 1300 SAMPLE SIZE = 17

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.0
13	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.800
15	1.000

*** STRATA NO. 2 GROUP NO. 1350 SAMPLE SIZE = 6

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.0
15	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE

VARIABLE NUMBER	PERCENTILE
11	0.[illegible]
12	1.000

*** STRATA NO. 2 GROUP NO. 1433 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
13	0.0
15	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.800
12	1.000

*** STRATA NO. 2 GROUP NO. 1455 SAMPLE SIZE = 6

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.0
14	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
13	0.800
12	1.000

*** STRATA NO. 2 GROUP NO. 1500 SAMPLE SIZE = 3

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
13	0.0
11	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.800
14	1.000

*** STRATA NO. 2 GROUP NO. 1550 SAMPLE SIZE = 3

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.0
14	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.800
13	1.000

*** STRATA NO. 2 GROUP NO. 1600 SAMPLE SIZE = 9

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.0
15	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
14	0.800
13	1.000

*** STRATA NO. 2 GROUP NO. 1640 SAMPLE SIZE = 1

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.0
13	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.800
11	1.000

*** STRATA NO. 2 GROUP NO. 1660 SAMPLE SIZE = 2

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE

VARIABLE NUMBER	PERCENTILE
12	0.0
15	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
13	[illegible]
11	1.000

*** STRATA NO. 2 GROUP NO. 1655 SAMPLE SIZE = 2

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.0
14	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
15	0.800
13	1.000

*** STRATA NO. 2 GROUP NO. 1715 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.0
14	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
13	0.800
15	1.000

*** STRATA NO. 2 GROUP NO. 1811 SAMPLE SIZE = 7

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
13	0.0
11	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE

VARIABLE NUMBER	PERCENTILE
12	0.900
15	1.[illegible]

*** STRATA NO. 2 GROUP NO. 1[illegible] SAMPLE SIZE = [illegible]

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.0
13	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
14	0.[illegible]
15	1.000

*** STRATA NO. [illegible] GROUP NO. 1[illegible] SAMPLE SIZE = [illegible]

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.0
1[illegible]	0.[illegible]

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
15	0.400
10	1.000

*** STRATA NO. [illegible] GROUP NO. 1[illegible] SAMPLE SIZE = 6

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.0
11	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
13	0.[illegible]00
10	1.000

*** STRATA NO. 2 GROUP NO. 2025 SAMPLE SIZE = 6

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
15	0.0
12	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
14	0.800
13	1.000

*** STRATA NO. 2 GROUP NO. 2026 SAMPLE SIZE = 6

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.0
15	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.800
13	1.000

*** STRATA NO. 2 GROUP NO. 2170 SAMPLE SIZE = 2

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.0
14	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.800
10	1.000

*** STRATA NO. 2 GROUP NO. 2146 SAMPLE SIZE = 6

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE

VARIABLE NUMBER	PERCENTILE
13	0.[illegible]
1[illegible]	0.[illegible]

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.800
10	1.000

*** STRATA NO. 2 GROUP NO. 2235 SAMPLE SIZE = 6

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
13	0.0
15	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
14	0.[illegible]00
12	1.000

*** STRATA NO. 2 GROUP NO. 2240 SAMPLE SIZE = 2

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
13	0.0
12	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.800
13	1.000

*** STRATA NO. 2 GROUP NO. [illegible] SAMPLE SIZE = 6

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
13	0.0
12	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE

VARIABLE NUMBER	PERCENTILE
15	0.800
13	1.000

*** STRATA NO. 2 GROUP NO. 2405 SAMPLE SIZE = 4

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
15	0.0
11	0.750

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.800
13	1.000

*** STRATA NO. 3 GROUP NO. 25 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
14	0.0
13	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.600
15	1.000

*** STRATA NO. 3 GROUP NO. 30 SAMPLE SIZE = 4

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
14	0.0
13	0.250

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.800
13	1.000

*** STRATA NO. [illegible] GROUP NO. 140 SAMPLE SIZE = 2

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
14	0.0
15	0.250

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.900
13	1.000

*** STRATA NO. [illegible] GROUP NO. 2[illegible] SAMPLE SIZE = 4

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
1[illegible]	[illegible]
13	0.700

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
1[illegible]	0.900
14	1.000

*** STRATA NO. 3 GROUP NO. 4[illegible] SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	[illegible]
13	0.700

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.[illegible]
13	1.000

*** STRATA NO. 3 GROUP NO. 430 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE

12	[illegible]
13	[illegible]

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.800
10	1.000

*** STRATA NO. [illegible] GROUP NO. [illegible] SAMPLE SIZE = 6

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
14	0.0
11	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.800
15	1.000

*** STRATA NO. [illegible] GROUP NO. [illegible] SAMPLE SIZE = 2

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.0
11	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
15	0.800
12	1.000

*** STRATA NO. 3 GROUP NO. [illegible] SAMPLE SIZE = 1

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
15	0.0
14	0.250

*** HIGH SCORES

VARIABLE NUMBER PERCENTILE

*** STRATA NO. [illegible] CAREER NO. [illegible] SAMPLE SIZE = [illegible]

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
15	0.[illegible]
12	[illegible]

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	[illegible]
13	[illegible]

*** STRATA NO. [illegible] CAREER NO. [illegible] SAMPLE SIZE = [illegible]

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
14	0.0
13	[illegible]

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
15	0.[illegible]
12	1.000

*** STRATA NO. [illegible] CAREER NO. [illegible] SAMPLE SIZE = 6

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.0
10	0.[illegible]

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
14	[illegible]
13	[illegible]

*** STRATUM NO. [illegible] CELL NO. 1090 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
13	0.0
10	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
15	0.200
14	1.000

*** STRATUM NO. [illegible] CELL NO. 1095 SAMPLE SIZE = 1

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
14	0.0
15	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.200
13	1.000

*** STRATUM NO. [illegible] CELL NO. 1210 SAMPLE SIZE = 3

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.0
12	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	[illegible]
14	1.000

*** STRATUM NO. [illegible] CELL NO. 1215 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE

1[illegible]	0.0
1[illegible]	[illegible]

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.[illegible]
13	1.000

*** STRATA NO. 3 GROUP NO. 1240 SAMPLE SIZE = 10

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
13	0.0
12	0.2[illegible]0

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
1[illegible]	0.[illegible]
1[illegible]	1.000

*** STRATA NO. 3 GROUP NO. 124[illegible] SAMPLE SIZE = 6

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
13	0.0
12	0.[illegible]

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
1[illegible]	0.[illegible]
11	1.[illegible]

*** STRATA NO. 3 GROUP NO. 13[illegible] SAMPLE SIZE = 7

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.[illegible]
11	0.200

*** HIGH SCORES

VARIABLE NUMBER PERCENTILE

14	0.800
13	1.000

*** STRATA NO. 3 GROUP NO. 1344 SAMPLE SIZE = 1

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
13	0.0
12	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
15	0.600
14	1.000

*** STRATA NO. 3 GROUP NO. 1350 SAMPLE SIZE = 3

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.0
11	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
14	0.800
12	1.000

*** STRATA NO. 3 GROUP NO. 1445 SAMPLE SIZE = 3

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
15	0.0
12	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
13	0.800
14	1.000

*** STRATA NO. 3 GROUP NO. [illegible] SAMPLE SIZE = 4

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
15	0.0
11	0.[illegible]

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.[illegible]
14	1.000

*** STRATA NO. 3 GROUP NO. [illegible] SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	[illegible]
[illegible]	[illegible]

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
14	0.[illegible]
12	1.000

*** STRATA NO. 3 GROUP NO. [illegible] SAMPLE SIZE = 2

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.0
14	0.[illegible]

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
1[illegible]	0.[illegible]
1[illegible]	1.000

*** STRATA NO. 3 GROUP NO. [illegible] SAMPLE SIZE = 1

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE

12	[illegible]
13	[illegible]

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
14	0.800
13	1.000

*** STRATA NO. 3 GROUP NO. 2015 SAMPLE SIZE = 2

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.0
11	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
14	0.800
13	1.000

*** STRATA NO. 3 GROUP NO. 2088 SAMPLE SIZE = 6

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.0
14	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.800
13	1.000

*** STRATA NO. 3 GROUP NO. 2170 SAMPLE SIZE = 2

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
14	0.0
13	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE

13	0.[illegible]
15	1.000

*** STRATA NO. 3 GROUP NO. 2[illegible]30 SAMPLE SIZE = 3

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
14	0.0
15	[illegible]

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
13	0.[illegible]
12	1.000

*** STRATA NO. 3 GROUP NO. 2[illegible]40 SAMPLE SIZE = 1

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
15	0.0
11	0.[illegible]0

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.000
13	1.000

*** STRATA NO. 3 GROUP NO. 2[illegible] SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
13	0.0
12	0.[illegible]

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
14	0.[illegible]0
10	1.[illegible]

*** STRATA NO. 4 GROUP NO. 10 SAMPLE SIZE = 6

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.0
13	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
15	0.800
12	1.000

*** STRATA NO. 4 GROUP NO. 20 SAMPLE SIZE = 1

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
13	0.0
14	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
15	0.800
11	1.000

*** STRATA NO. 4 GROUP NO. 235 SAMPLE SIZE = 4

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
14	0.0
12	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.800
11	1.000

*** STRATA NO. 4 GROUP NO. 470 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE

```
                    11             0.0
                    15             0.200

*** HIGH SCORES
          VARIABLE NUMBER      PERCENTILE
                    12             0.800
                    14             1.000

*** STRATA NO.   4     GROUP NO.   435     SAMPLE SIZE =    2

*** LOW SCORES
          VARIABLE NUMBER      PERCENTILE
                    13             0.0
                    15             0.200

*** HIGH SCORES
          VARIABLE NUMBER      PERCENTILE
                    12             0.800
                    15             1.000

*** STRATA NO.   4     GROUP NO.   520     SAMPLE SIZE =    6

*** LOW SCORES
          VARIABLE NUMBER      PERCENTILE
                    12             0.0
                    15             0.200

*** HIGH SCORES
          VARIABLE NUMBER      PERCENTILE
                    11             0.800
                    14             1.000

*** STRATA NO.   4     GROUP NO.   555     SAMPLE SIZE =    4

*** LOW SCORES
          VARIABLE NUMBER      PERCENTILE
                    15             0.0
                    12             0.200

*** HIGH SCORES
          VARIABLE NUMBER      PERCENTILE
```

13	0.800
10	1.000

*** STRATA NO. 4   GROUP NO. 1028   SAMPLE SIZE = 9

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.0
13	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
14	0.800
10	1.000

*** STRATA NO. 4   GROUP NO. 1029   SAMPLE SIZE = 2

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
14	0.0
12	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.800
13	1.000

*** STRATA NO. 4   GROUP NO. 1030   SAMPLE SIZE = 3

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.0
10	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
15	0.800
12	1.000

*** STRATA NO. [illegible] GROUP NO. 1554 SAMPLE SIZE = 1

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
14	0.0
11	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
15	0.800
12	1.000

*** STRATA NO. [illegible] GROUP NO. 2510 SAMPLE SIZE = 1

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.0
12	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
14	0.800
11	1.000

*** STRATA NO. [illegible] GROUP NO. [illegible] SAMPLE SIZE = 2

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
14	0.0
11	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.800
10	1.000

*****STEP COST = $ 4.54

INSTITUTE FOR SOCIAL RESEARCH [illegible] SYSTEM   03/11/74

****LISTING OF SETUP FOLLOWS:

```
CARD        1         2         3         4         5         6         7         8
NO.  1234567890123456789012345678901234567890123456789012345678901234567890123456789O
 1   RUN NORM
 2   TEST RUN
 3   CVAR=3 SVAR=6 PREF STAN NORM INFI=IN1*
 4   V13-V154
 5   READFILE
```

PROGRAM NORM OCTOBER 1974

GVAR=3 SVAR=6 PRED STAN NORM INFI=IN1*

THE VARIABLE LIST IS:

V10-V15*

	[illegible]	TYPE	VARIABLE NAME	[illegible]	WIDTH	[illegible]	RESP.	[illegible]	[illegible]	[illegible]	ID	[illegible]
T	[illegible]	0	WORK GROUP NO.	19	[illegible]	0	1	[illegible]				00000
T	[illegible]	0	2-DIGIT CLASS	28	2	0	1	0000099				00000
T	[illegible]	0	10 CJ HAS CLEAR GOALS	33	1	0	1	0000009	0000006			00000
T	[illegible]	0	11 WK ACTIVITY ORGANIZED	34	1	0	1	0000009	0000006			00000
T	[illegible]	0	12 YOU GET OTH UNIT INFO	35	1	0	1	0000009	0000006			00000
T	[illegible]	0	13 SUPS OPEN TO IDEAS	36	1	0	1	0000009	0000006			00000
T	14	0	14 TOLD ENOUGH TO DO JOB	37	1	0	1	0000009	0000006			00000
T	15	0	15 YOU FEEL LOYAL TO CO	38	1	0	1	0000009	0000006			00000

```
*** PARAMETER SPECIFICATION

STRATA VARIABLE IS :      2-DIGIT CLASS                VARIABLE NO.    6
GROUP VARIABLE IS :       WORK GROUP NO.               VARIABLE NO.    3
MINIMUM PERCENTILE IS THE 40TH

MAXIMUM PERCENTILE IS THE 60TH
PREDICTED CRITERION SCORE MODE
NORM DATA SET
BAD DATA WILL TERMINATE RUN
EITHER MISSING DATA CODE VALUE FOR ANY VARIABLE WILL DELETE THE CASE

*** AFTER GLOBAL FILTERING
     SAMPLE SIZE =  125
     NO. OF STRATA =  5
     NO. OF GROUPS = 17

*** NO. OF CASES ELIMINATED BECAUSE OF MD1 =  0

*** NO. OF CASES ELIMINATED BECAUSE OF MD2 =  0

*** FINAL NO. OF CASES FOR ANALYSIS =  125
```

*** AGGREGATED DATA ***

STRATA	GROUP	SIZE	10	11	12	13	14	15
1	31110	14	3.21	2.71	2.50	2.57	2.73	3.57
1	31120	18	2.93	2.60	1.95	1.74	2.50	3.11
1	31130	14	2.57	2.07	2.00	2.14	2.43	3.50
1	31140	4	3.50	3.00	3.00	3.75	4.00	4.00
1	31150	7	2.36	2.43	2.00	2.29	2.71	4.71
1	32210	8	2.50	2.25	2.62	2.25	2.50	3.25
2	32220	13	3.46	2.77	1.54	3.38	2.62	3.69
2	32230	15	2.13	2.73	2.00	2.53	3.00	3.60
2	32100	3	3.67	3.67	3.00	3.67	4.33	4.33
2	32100	4	3.25	2.75	2.00	3.25	2.50	3.00
2	32200	5	3.00	2.40	2.20	2.40	2.80	3.30
2	32400	1	4.00	3.00	3.00	4.00	5.00	5.00
3	21000	5	2.20	2.40	2.60	3.00	2.40	4.40
3	22000	8	4.00	2.42	2.12	4.00	2.37	4.25
3	23000	2	2.50	4.00	3.00	4.00	3.50	4.[illegible]
4	10110	3	3.67	4.33	3.33	4.00	4.00	4.33
99	[illegible]	1	5.00	4.00	3.00	2.00	4.00	2.00

*** LISTING OF STANDARDIZED MATRIX

STRATA	GROUP	FREQUENCY	VARIABLE NOS. 10	11	12	13	14	15
1	33110	14	0.24	0.31	0.53	0.17	-0.07	-0.73
1	33120	18	-0.91	-1.35	-0.69	-1.06	-0.66	-1.22
1	33130	14	-1.71	-1.13	-0.44	-0.66	-0.81	-0.39
1	33140	4	1.11	1.68	1.82	2.46	2.47	0.65
1	33150	7	-0.84	-0.05	-0.44	-0.34	-0.22	2.22
1	33210	9	1.11	-0.59	0.97	-0.45	-0.66	-0.91
1	34220	13	1.03	0.08	-1.48	-0.19	-0.42	[illegible]
1	34230	15	-0.00	-0.34	-0.44	0.10	0.38	-0.17
2	32100	3	0.43	1.67	0.39	0.56	0.65	.41
2	33100	4	-0.63	-0.85	-1.21	-0.13	-1.11	-1.41
2	33200	5	-1.25	-0.67	-0.77	-1.55	-0.82	-0.32
2	34200	1	1.36	-0.15	0.99	1.12	1.29	1.22
3	21000	5	-0.05	-1.22	-1.31	-1.41	-1.37	0.16
3	22000	8	1.25	1.23	1.12	0.71	0.59	-1.30
3	23000	2	-1.20	-0.03	0.19	0.71	0.39	1.14
4	30510	3	0.0	0.0	0.0	0.0	0.0	0.0
[illegible]	[illegible]	1	0.0	0.0	0.0	0.0	0.0	0.0

*** LISTING OF PRED. CRIT. SCORES

STRATA	GROUP	FREQUENCY	VARIABLE NOS.	10	11	12	13	14	15
1	33110	14		0.06	0.29	0.01	0.11	-0.03	-0.17
1	33120	18		-0.24	-0.48	-0.01	-0.68	-0.26	-0.88
1	33130	14		-0.45	-0.40	-0.01	-0.43	-0.31	-0.28
1	33140	4		0.29	0.59	0.03	1.61	0.95	0.49
1	33150	7		-0.22	-0.02	-0.01	-0.25	-0.06	1.59
1	33210	8		0.29	-0.21	0.01	-0.30	-0.26	-0.66
1	33220	13		0.26	0.34	-0.02	-0.12	-0.16	0.02
1	33230	15		-0.00	-0.12	-0.01	0.06	0.15	-0.12
2	32100	3		0.30	0.93	0.34	0.35	0.30	0.23
2	33100	4		-0.37	-0.46	-0.41	-0.08	-0.52	-0.81
2	33200	5		-0.78	-0.39	-0.26	-0.35	-0.38	-0.18
2	33300	1		0.84	-0.09	0.34	0.69	0.60	0.76
3	21000	5		-0.01	-0.42	-0.64	-0.95	-0.82	0.04
3	32000	8		0.29	0.43	0.55	0.48	0.59	-0.32
3	2[illegible]000	2		-0.28	-0.01	0.09	0.48	0.23	0.28
4	10010	3		0.0	0.0	0.0	0.0	0.0	0.0
99	99999	1		0.0	0.0	0.0	0.0	0.0	0.0

*** LISTING OF PERCENTIZED MATRIX

STRATA	GROUP	FREQUENCY	VARIABLE NOS.	10	11	12	13	14	15
1	33110	14		0.60	1.00	0.40	0.80	0.20	0.0
1	33120	18		0.60	0.40	1.00	0.20	0.60	0.0
1	33130	14		0.0	0.40	1.00	0.20	0.60	0.80
1	33140	4		0.20	0.60	0.0	1.00	0.80	0.40
1	33150	7		0.20	0.60	0.80	0.0	0.40	1.00
1	33210	8		1.00	0.60	0.80	0.20	0.40	0.0
1	33220	13		0.80	1.00	0.40	0.20	0.0	0.60
1	33230	15		0.60	0.20	0.40	0.80	1.00	0.0
2	32100	3		0.40	1.00	0.60	0.80	0.20	0.0
2	33100	4		0.80	0.40	0.60	1.00	0.20	0.0
2	33200	5		0.20	0.40	0.80	0.0	0.60	1.00
2	[illegible]	1		1.00	0.0	0.20	0.60	0.40	0.80
3	[illegible]	5		0.80	0.60	0.40	0.0	0.20	1.00
[illegible]	[illegible]	8		0.20	0.40	0.40	0.60	1.00	0.0
3	[illegible]	2		0.0	0.20	0.40	1.00	0.60	0.80
4	10010	3		0.0	[illegible]	0.40	0.80	0.80	1.00
[illegible]	[illegible]	1		0.0	[illegible]	0.40	0.60	0.80	1.00

*** LISTING OF [illegible] EXTREMES BY GROUP
RANK ORDERED BY PERCENTILE MAGNITUDE

*** STRATA NO. 1 GROUP NO.[illegible] SAMPLE SIZE = 14

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
15	0.0
14	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
13	0.800
11	1.000

*** STRATA NO. 1 GROUP NO.23120 SAMPLE SIZE = 18

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
15	0.0
13	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.800
12	1.000

*** STRATA NO. 1 GROUP NO.[illegible] SAMPLE SIZE = 14

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.0
13	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
15	0.800
12	1.000

*** STRATA NO. 1 GROUP NO.33140 SAMPLE SIZE = 4

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.0
13	0.000

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
14	0.500
13	1.000

*** STRATA NO. 1 GROUP NO.33150 SAMPLE SIZE = 7

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
13	0.0
13	0.250

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.500
15	1.000

*** STRATA NO. 1 GROUP NO.33210 SAMPLE SIZE = 8

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
13	0.0
13	0.750

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.500
20	1.000

*** STRATA NO. 1 GROUP NO.33220 SAMPLE SIZE = 13

*** LOW SCORES

VARIABLE NUMBER PERCENTILE

VARIABLE NUMBER	PERCENTILE
14	0.0
13	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.800
11	1.000

*** STRATA NO. 1   GROUP NO.33230   SAMPLE SIZE = 15

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
15	0.0
11	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
13	0.800
14	1.000

*** STRATA NO. 2   GROUP NO.22100   SAMPLE SIZE = 3

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
15	0.0
14	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
13	0.800
11	1.000

*** STRATA NO. 2   GROUP NO.33100   SAMPLE SIZE = 4

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
15	0.0
14	0.200

*** HIGH SCORES

VARIABLE NUMBER   PERCENTILE

10	[illegible]
14	1.000

*** STRATA NO. 5 GROUP NO.33300 SAMPLE SIZE = 6

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
13	0.0
10	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.800
15	1.000

*** STRATA NO. 2 GROUP NO.33300 SAMPLE SIZE = 1

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.0
12	0.700

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
15	0.900
10	1.000

*** STRATA NO. 5 GROUP NO.21000 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
13	0.0
14	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.800
15	1.000

*** STRATA NO. [illegible]   GROUP NO.[illegible]   SAMPLE SIZE = [illegible]

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
15	0.0
10	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.800
14	1.000

*** STRATA NO. 3   GROUP NO.23000   SAMPLE SIZE = 2

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.0
11	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
15	0.800
13	1.000

*** STRATA NO. 4   GROUP NO.10010   SAMPLE SIZE = 3

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.0
11	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
14	0.800
15	1.000

*** STRATA NO. 99   GROUP NO.99999   SAMPLE SIZE = 1

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE

10	0.0
11	0.000

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
14	0.950
15	1.000

*****STEP COST = $ 1.23

****** NEXT RUN CARDS: TOTAL COST = $ 5.78

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---693834----------------693834----------------693834----------------693834----------------693834----------

J . . . 693834        UNIVERSITY OF MICHIGAN TERMINAL SYSTEM (MODEL G1124)                13:54.57   WED OCT 16/74

 6666666666    9999999999    3333333333    8888888888    3333333333        444
6666666666666 999999999999  333333333333  888888888888  333333333333      4444
66        66  99        99  33        33  88        88  33        33     44 44
66            99        99            33  88        88            33    44  44
66            99        99            33  88        88            33   44   44
666666666666  999999999999          3333   8888888888         33333  44444444444
6666666666666  99999999999          3333   8888888888         33333  44444444444
66        66            99            33  88        88            33        44
66        66            99            33  88        88            33        44
66        66  99        99  33        33  88        88  33        33        44
6666666666666 999999999999  333333333333  888888888888  333333333333        44
 6666666666    9999999999    3333333333    8888888888    3333333333         44

          SSSSSSSSSS   DDDDDDDDDD   HH        HH  TTTTTTTTTTTT
         SSSSSSSSSSSS  DDDDDDDDDDD  HH        HH  TTTTTTTTTTTT
         SS        SS  DD        DD HH        HH       TT
         SS            DD        DD HH        HH       TT
         SSS           DD        DD HH        HH       TT
          SSSSSSSSSS   DD        DD HHHHHHHHHHHH       TT
           SSSSSSSSSS  DD        DD HHHHHHHHHHHH       TT
                  SSS  DD        DD HH        HH       TT
                   SS  DD        DD HH        HH       TT
         SS        SS  DD        DD HH        HH       TT
         SSSSSSSSSSSS  DDDDDDDDDDD  HH        HH       TT
          SSSSSSSSSS   DDDDDDDDDD   HH        HH       TT

---693834----------------693834----------------693834----------------693834----------------693834----------
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